THE
NATURAL
HISTORY
MUSEUM

HRH The Princess of Wales, Patron of The Natural History Museum

INTRODUCTION

Welcome to The Natural History Museum. We hope that this guide will help you make the most of your visit and encourage you to discover all the Museum has to offer.

The Natural History Museum - now incorporating our neighbour, the Geological Museum - offers a full range of lively, innovative exhibitions featuring the Earth itself as well as life upon it. In addition to the permanent exhibitions you will find a changing programme of temporary displays and special events, including films, workshops, lectures and guided tours.

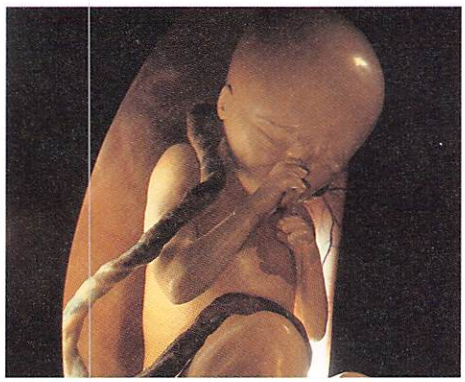
But the Museum is not only a dynamic exhibition centre - it is also a major scientific research institution. Behind the scenes more than 300 scientists study the diversity of nature using the Museum's vast and unrivalled collections. Some of their work is highlighted in this guide.

We hope that you enjoy your visit and will come again soon.

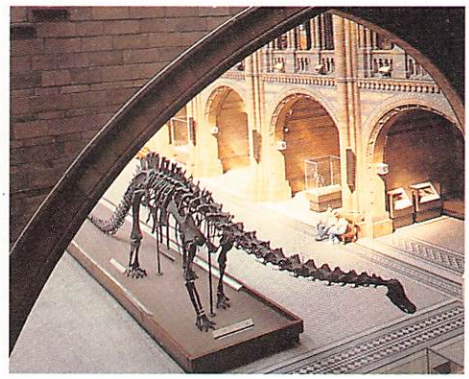
Neil Chalmers

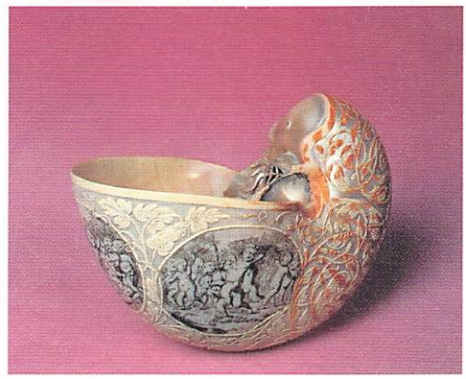
Neil Chalmers
Director, The Natural History Museum

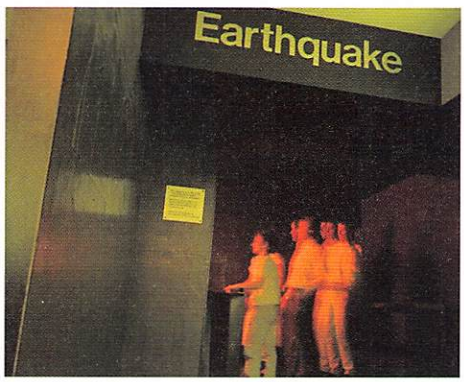
HIGHLIGHTS OF THE MUSEUM

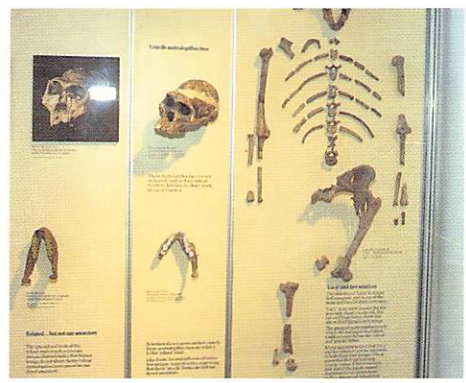


LONDON ZOO









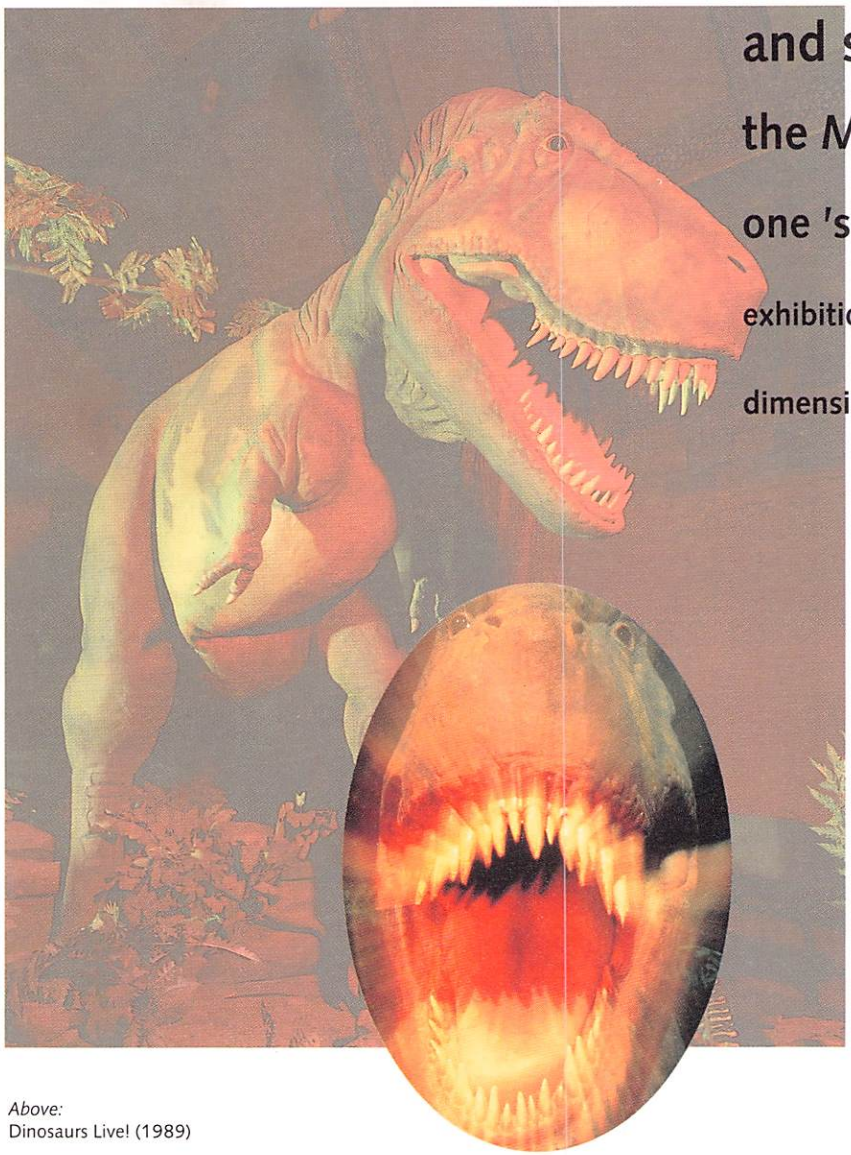
Top: lifesize model of a blue whale - **Discovering mammals**
Centre: skeleton of *Diplodocus* - **Dinosaurs and their living relatives**
Bottom: earthquake experience - **Story of the Earth**

Top: foetus in the womb - **Human biology**
Centre: interactive video about memory - **Human biology**
Bottom: 1 Crawley House - **'Creepy-crawlies'**

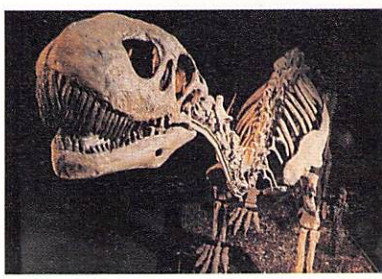
Top: live fungus growing ants - **'Creepy-crawlies'**
Centre: Sir Hans Sloane's carved *Nautilus* shell - **Minerals, rocks and meteorites**
Bottom: 'Lucy' - **Man's place in evolution**

MUSEUM SHOWS

Apart from permanent exhibitions and small temporary displays, the Museum mounts at least one 'show' - a spectacular temporary exhibition - each year, offering visitors an extra dimension of education and entertainment.



Above:
Dinosaurs Live! (1989)



Right: Chinese dinosaurs (1988)

Future plans...

1991 The Meadow *- wandering through a meadow of six-metre high flowers and grasses, visitors will see nature from a new viewpoint*

Right: Dinosaur makes the news!

Why did the Dino cross the road?

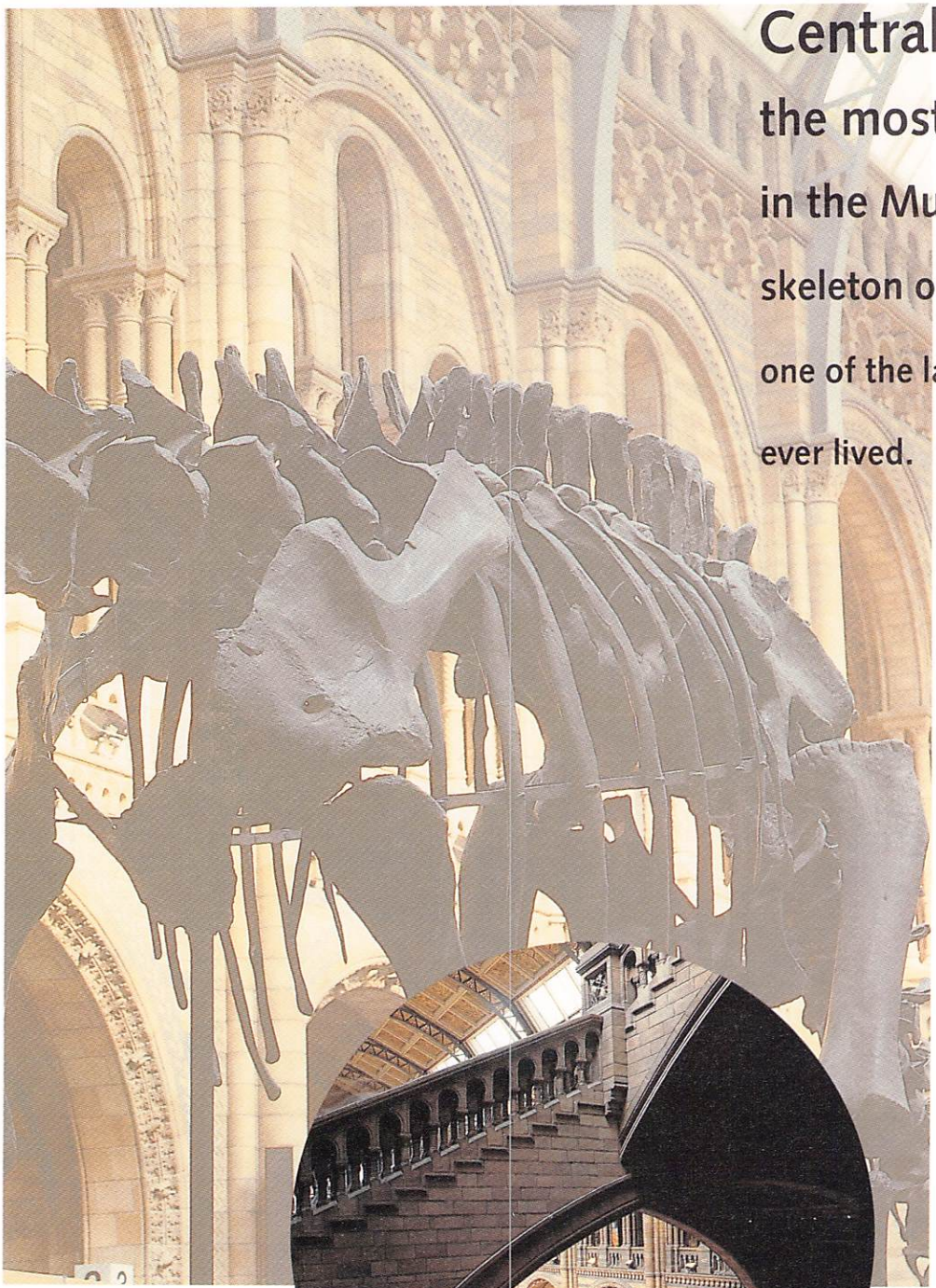
ZEBRA crossings, pelican crossings and now Monster crossings — walk over the road with a Tyrannosaurus Rex and you know the traffic will stop!

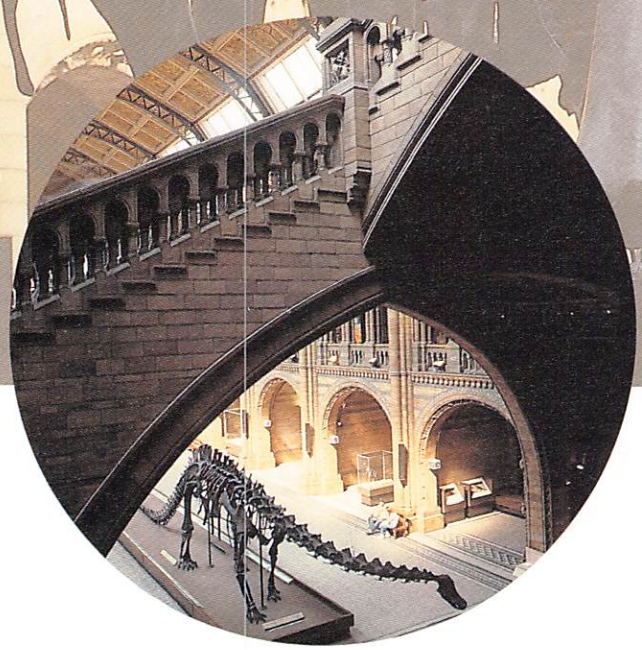
This moving, roaring, robotic model from prehistory is on its way to the new Dinosaurs Live! exhibition at London's Natural History Museum

DINOSAURS

Below: Perfect marriage of architecture and exhibit!

Dominating the Central Hall and among the most impressive sights in the Museum is the massive skeleton of the dinosaur *Diplodocus*, one of the largest land animals that ever lived.





Circle: Although this *Diplodocus* skeleton is over 26 metres long, its skull is about the same size as that of a cow

Surrounding *Diplodocus* is a fine collection of dinosaur and other fossils that form part of the exhibition of *Dinosaurs and their living relatives*.

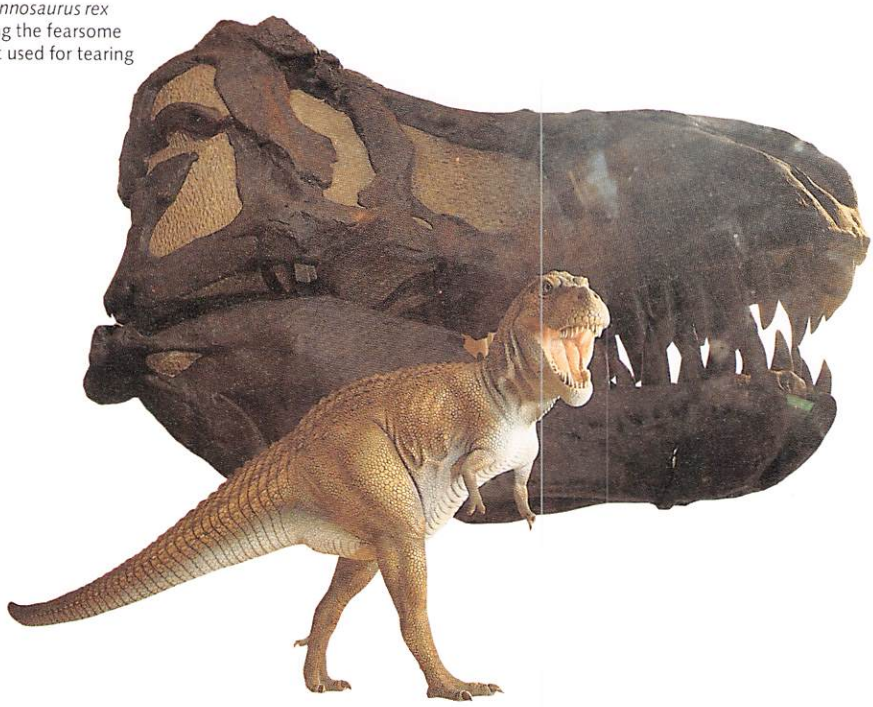
Dinosaurs lived on Earth for about 140 million years, but became extinct, fairly abruptly, about 60 million years before the appearance of humans. In the exhibition you can examine their fossilized remains, which have been found in rocks from many parts of the world.

Fossilized bones, teeth, and occasionally skin impressions are the only direct evidence we have of what dinosaurs were like. Skeletons are very rarely found complete and it is not easy to piece together the fragments to reconstruct a whole animal.

In order to do this we must use the knowledge we have about animals living today. The exhibition explains that because living and extinct animals are related to one another we can use features they have in common to place them in groups. Often the results are fascinating. For example, evidence suggests that birds may well be the closest living relatives of the dinosaurs.

AND THEIR LIVING RELATIVES

Model and life-size skull of *Tyrannosaurus rex* showing the fearsome teeth it used for tearing flesh



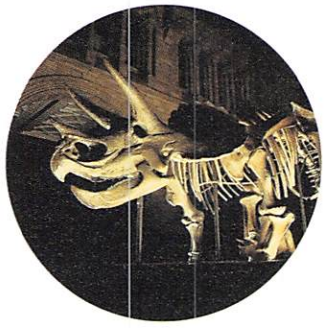
Top right: Grouping animals by the features they share
Centre: Find out what barn owls, dinosaurs and Nile crocodiles have in common
Right: Which animals have bird characteristics?

Dinosaurs were reptiles, but they varied enormously in size, shape and lifestyle. There were two basic kinds, the saurischians or 'lizard-hipped' dinosaurs and the ornithischians or 'bird-hipped' dinosaurs. Saurischians include all carnivores, such as the fierce *Tyrannosaurus rex* as well as some herbivores, such as *Diplodocus*. Ornithischians were all plant eaters. *Triceratops* with its strong horns, and the armoured *Scolosaurus* were both ornithischians.

Dinosaurs lived on land, but there were many other creatures, alive at the same time, that flew or lived in the seas. Plesiosaurs have short wide bodies and powerful flippers. They lived mainly in water but, like seals, probably came on land to breed. Ichthyosaurs, which are more dolphin-like in shape, were fully aquatic.

Flying prehistoric animals included pterosaurs - reptiles with wings made of skin, and *Archaeopteryx* - the oldest known bird. *Archaeopteryx* had a wishbone and feathers, two features unique to birds, but it also had reptilian features - clawed fingers, teeth and a long bony tail.

It is only about 150 years since dinosaurs were first identified but since then they and other fossil animals have been unearthed in every continent, and many exciting new discoveries are still being made.



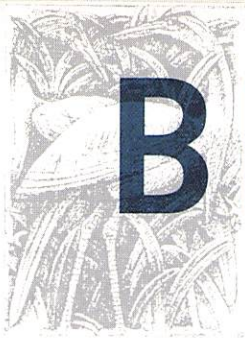
Top left: Not as fierce as it looks! *Triceratops* was a plant eater
Centre: Sea-living ichthyosaurs were fully aquatic
Left: With a wing span of over 7 metres, *Pteranodon* is one of the largest flying animals ever known

'Claws' - the Surrey dinosaur

In 1983 William Walker, an amateur fossil hunter, came across an enormous claw bone in a Surrey clay pit. A team of palaeontologists from The Natural History Museum excavated the site and uncovered many more bones that they identified as the remains of a previously unknown dinosaur that lived 124 million years ago. Scientists named the new dinosaur Baryonyx walkeri, *although it became better known by its nickname 'Claws'.*

In the Museum's palaeontology laboratory, scientists carefully separated the bones from the surrounding rock, and then pieced together a large part of the skeleton. By working out the size and position of the muscles, they concluded that 'Claws' walked mostly on its back legs and that it ate flesh including fishes. The great claw may have been used for hooking these out of lakes, rivers and marshes that existed in southern England during the Early Cretaceous period.

A New Look at the Dinosaurs by Alan Charig
British Fossils by J C Thackray
The Living Fossil Fish Coelacanth by P H Greenwood



BIRDS

Below: An ornate ceiling and terracotta pillars enhance the colourful specimens in the bird gallery

In the bird gallery you can admire a large variety of specimens presented in a traditional way. The oldest case, packed full of hummingbirds, is over a hundred years old.

Like many early Victorian displays, the case was intended to be purely decorative.

Circle: A few of the birds to be found in a British woodland

Top: Listen to the cries of seabirds in the British bird pavilion
Centre: Come face to face with family of ostriches
Bottom: The oldest case in the Museum

Left: Although hornbills resemble toucans, they belong to a different family of birds

Most of the birds are displayed in groups of closely related kinds, or species. One group you may like to investigate is the birds of prey, where there are magnificent specimens of a monkey-eating eagle and a bald sea eagle. Along the gallery you will also find cranes, storks, parrots, and flightless birds, such as ostriches and cassowaries.

Towards the end of the gallery there is an opportunity to see some famous birds which are now extinct. The flightless dodo and the passenger pigeon are probably the best known. Both these birds have died out over the last 200 years because they were slaughtered in large numbers by humans. In 1810 there were over 2000 million passenger pigeons in North America, but by 1914, less than 150 years after their discovery, there were none.

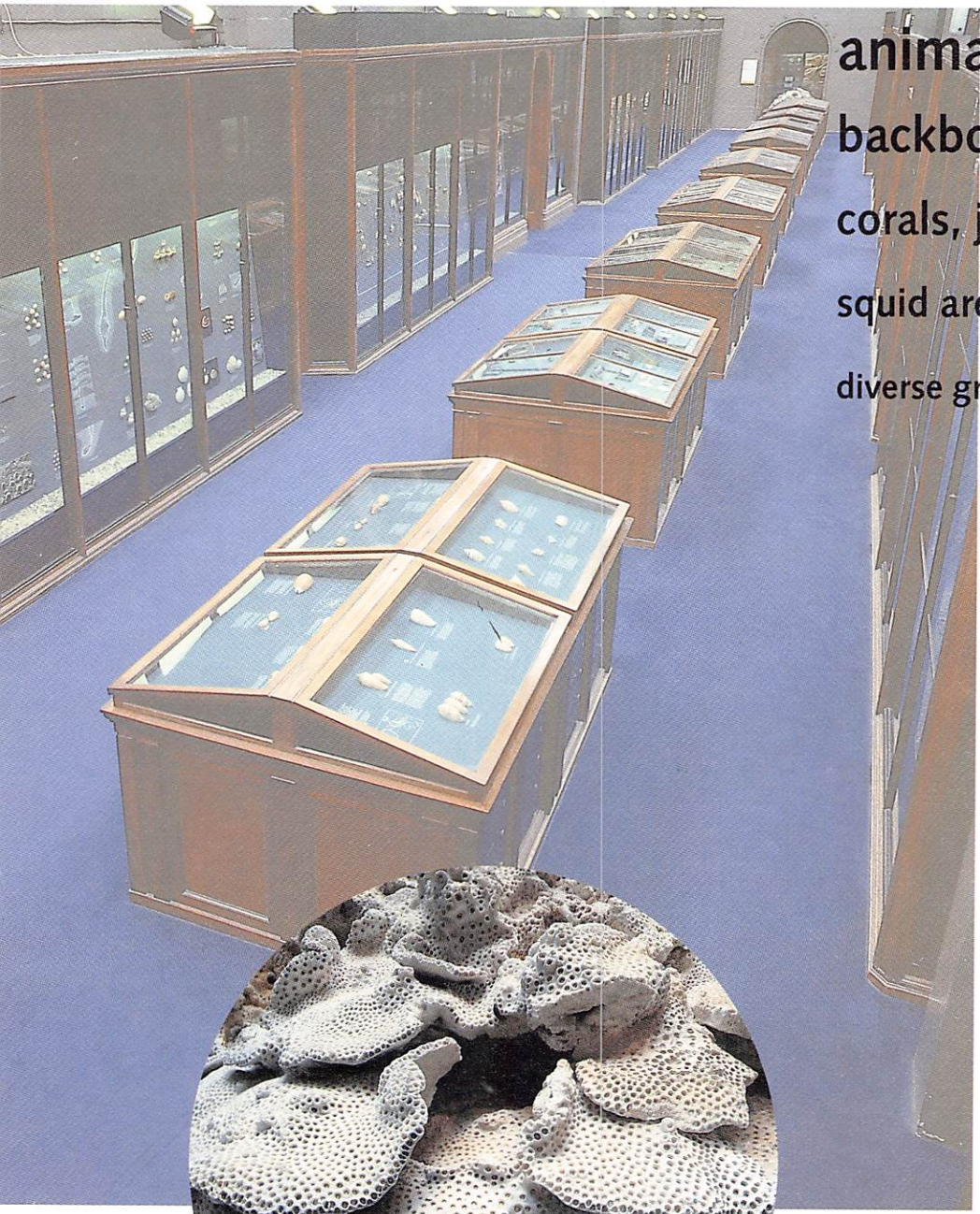
A special section dedicated to British birds forms an impressive conclusion to the gallery. Here you can see native birds shown in their natural habitats and listen to recordings of their songs.

Above: The massive bill of this toucan, full of air spaces, is surprisingly light
Circle: The bright orange colour of this cock-of-the-rock is found in the males only

The Cotingas by D W Snow
A study of Blackbirds by D W Snow
The Falcons of the World by T J Cade
Crows of the World 2nd ed. by D Goodwin
Estrildid Finches of the World by D Goodwin

MARINE

Below: Some of the original display cases that remain in this gallery
Circle: The massive skeleton of a typical marine coral



Invertebrates are animals without a backbone. Sea urchins, corals, jellyfishes, snails and squid are all members of this diverse group.

Guarding the entrance to the Museum's exhibition of invertebrates is one of the largest, a giant squid, which can reach a daunting 15 metres in length.

Like the bird gallery the exhibition is traditionally presented. The display cases (though not their contents!) date from about 1882 and their layout in the gallery is typical of the period. During daylight hours you may notice light pouring though the glass roof of the gallery. This feature was originally designed to light the specimens before the days of electricity.

Individual exhibits deal with different animals grouped according to features they share. You will find echinoderms - starfishes and sea urchins, Porifera - sponges, and cephalopods - squid and octopuses.

You can also see the shells of molluscs. Many of these are highly prized for their beauty and are used as ornaments and trinkets. In some Pacific Islands cowrie shells were even used as money. This practice ceased when devaluation meant that the quantity of shells needed to make even modest purchases became impracticable to handle.

INVERTEBRATES

Above: The giant squid stands guard over the gallery

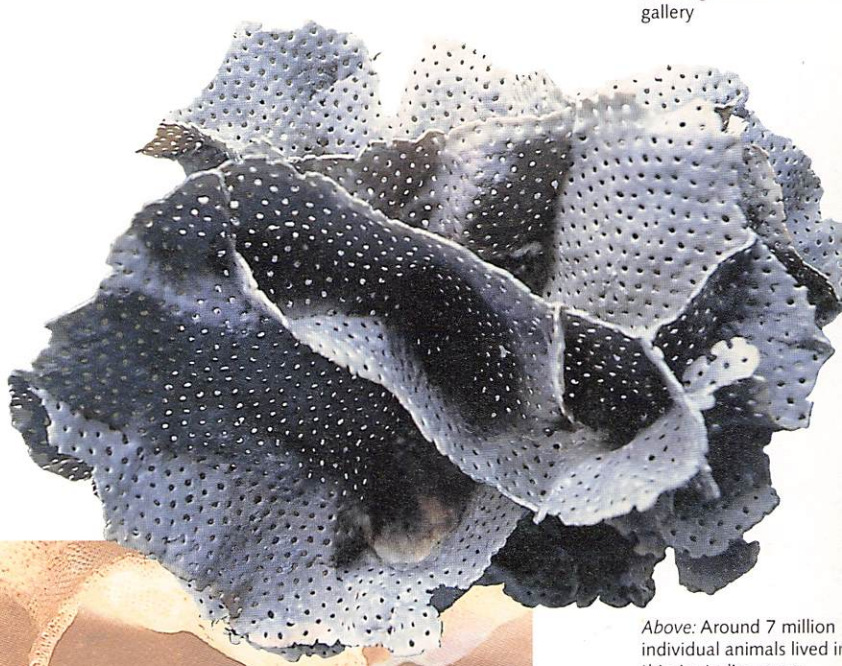
Coming clean

The Mersey is, at present, Britain's dirtiest river and in parts the water quality is so poor that it is virtually devoid of life. In response the Government and the North West Water Authority have mounted a major campaign to clean up the Mersey and the Museum has been asked to help monitor its progress.

In clean estuaries, worms called nematodes are numerous in the mud and sand. In badly polluted areas the numbers of both species and individuals are drastically reduced. Museum scientists take samples of mud and sand from five different sites along the 30 kilometre length of the Mersey estuary. In the laboratory the samples are specially treated to remove the nematodes which are then counted, identified and the results analysed by computer.

Through this technique, the Museum is able to provide evidence of the success of the programme to improve water quality in the Mersey.

This work is carried out under contract to the Water Research Centre and the Department of the Environment, whose permission to publish this information has been obtained.



Above: Around 7 million individual animals lived in this Australian moss animal colony
Left: Animals such as shellfish often shelter in bryozoa - colonial animals related to corals

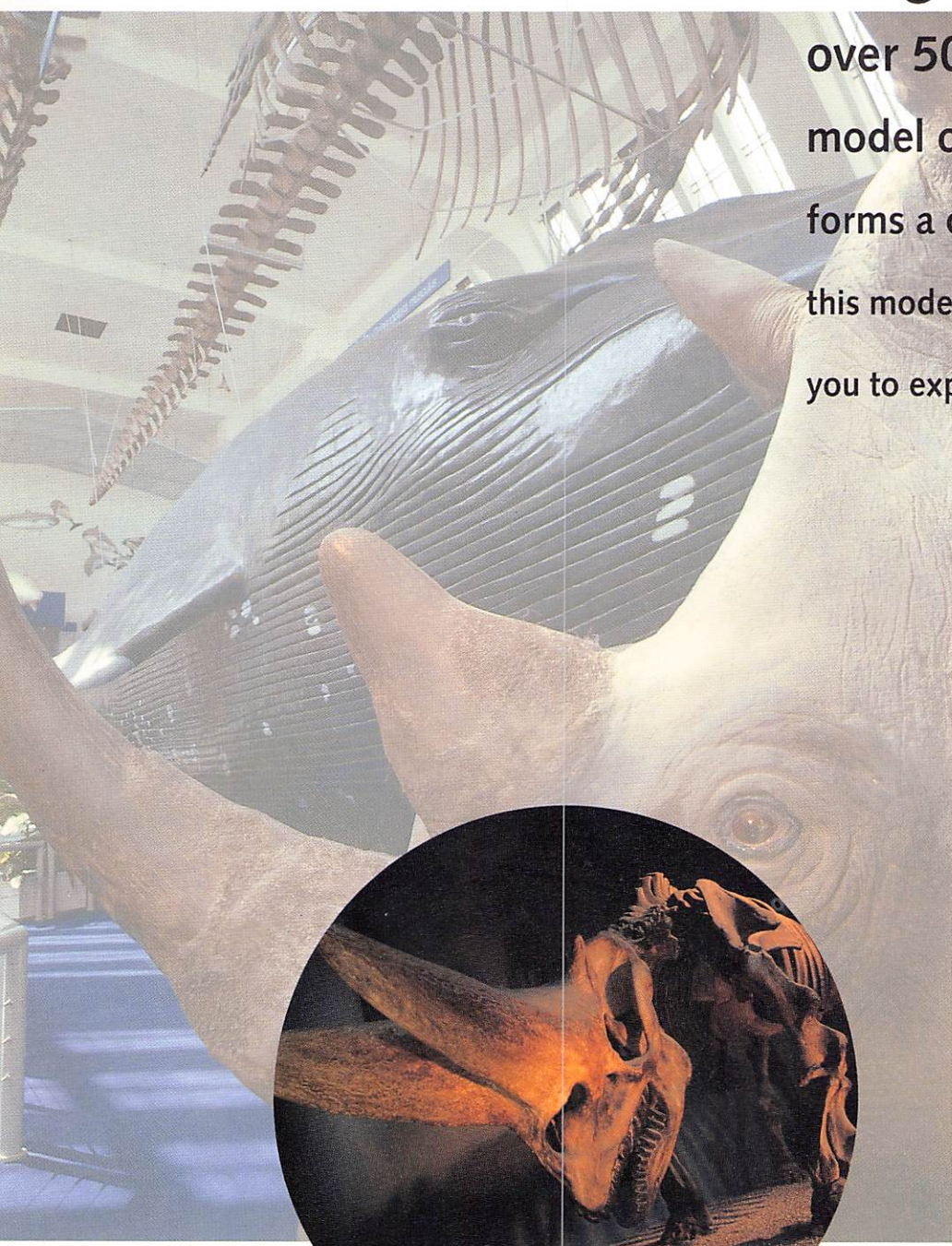
Far left: The blue nodules on the body and tentacles of this squid are light detecting cells
Centre: Part of a coral collection given to HM Queen Elizabeth II on behalf of the people of Queensland, Australia
Left: Shell cameos - nature into art

Invertebrate Animals: collection and preservation by R J Lincoln & J G Sheals

DISCOVERING

Suspended from the gallery ceiling for over 50 years, the life-size model of a blue whale now forms a dramatic centrepiece to this modern exhibition which invites you to explore the world of mammals.

Below: Both whales and rhinos are mammals in danger of extinction



The exhibition has two sections, one on the ground floor and the other on the balcony. The ground floor exhibits give you an opportunity to view modern mammals alongside their fossil ancestors, and to learn about mammalian evolution.

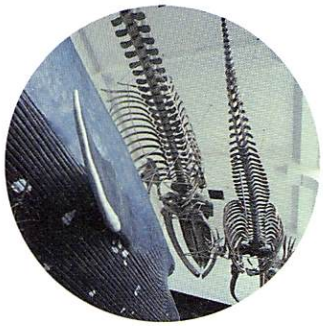
A good starting point is *Arsenotherium*, a strange, extinct mammal which lived 35 million years ago and is thought to be related to all the other mammals in the exhibition.

Present-day African and Asian elephants are one group whose evolution can be traced back through many stages. One of their most primitive ancestors was a small swamp-dwelling animal called *Moeritherium*.

The largest group of hoofed mammals is the artiodactyls. All have an even number of toes on each foot. Hippopotamuses, camels, deer and goats are just a few of those featured in the gallery.

Circle: The remains of *Arsinotherium* were found in Egypt near the ancient tomb of Queen Arsinoe

MAMMALS



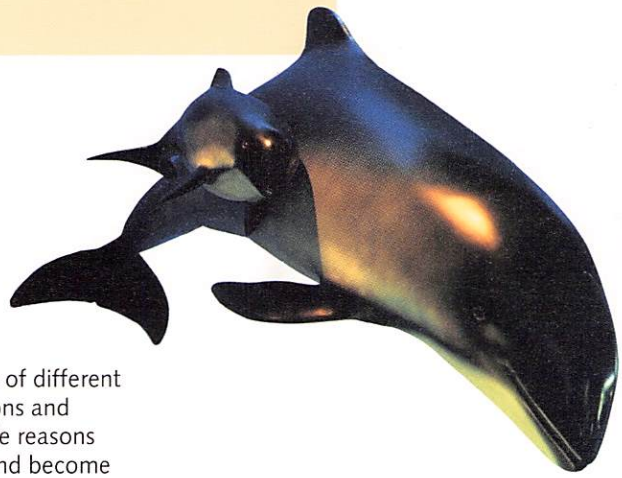
Left: The structure of their skeletons suggests that whales may have evolved from land-living animals
Centre: The cavernous mouth of a hippo
Bottom: African and Indian elephants

Above: Hold your nose, close your mouth and say 'oh' three times!

Above: Horses' and elephants' legs *are* different!
Below: Cetaceans, even when young, are superbly adapted to life in water

Stranded

To find out more about the biology of cetaceans, the Museum registers details of all the whales, dolphins and porpoises that are reported stranded on Britain's shores. On average, about 50 strandings are recorded each year by coastguards, who fill in an identification form supplied by the Museum. The completed form is then used by the scientists to identify what species the stranded cetacean is and add it to the records.
Between 1967 and 1986 there were 946 strandings involving 1117 animals - mostly common porpoises, pilot whales and common dolphins. The largest animal that has ever lived - the blue whale - has also been recorded, but not since the 1920s.



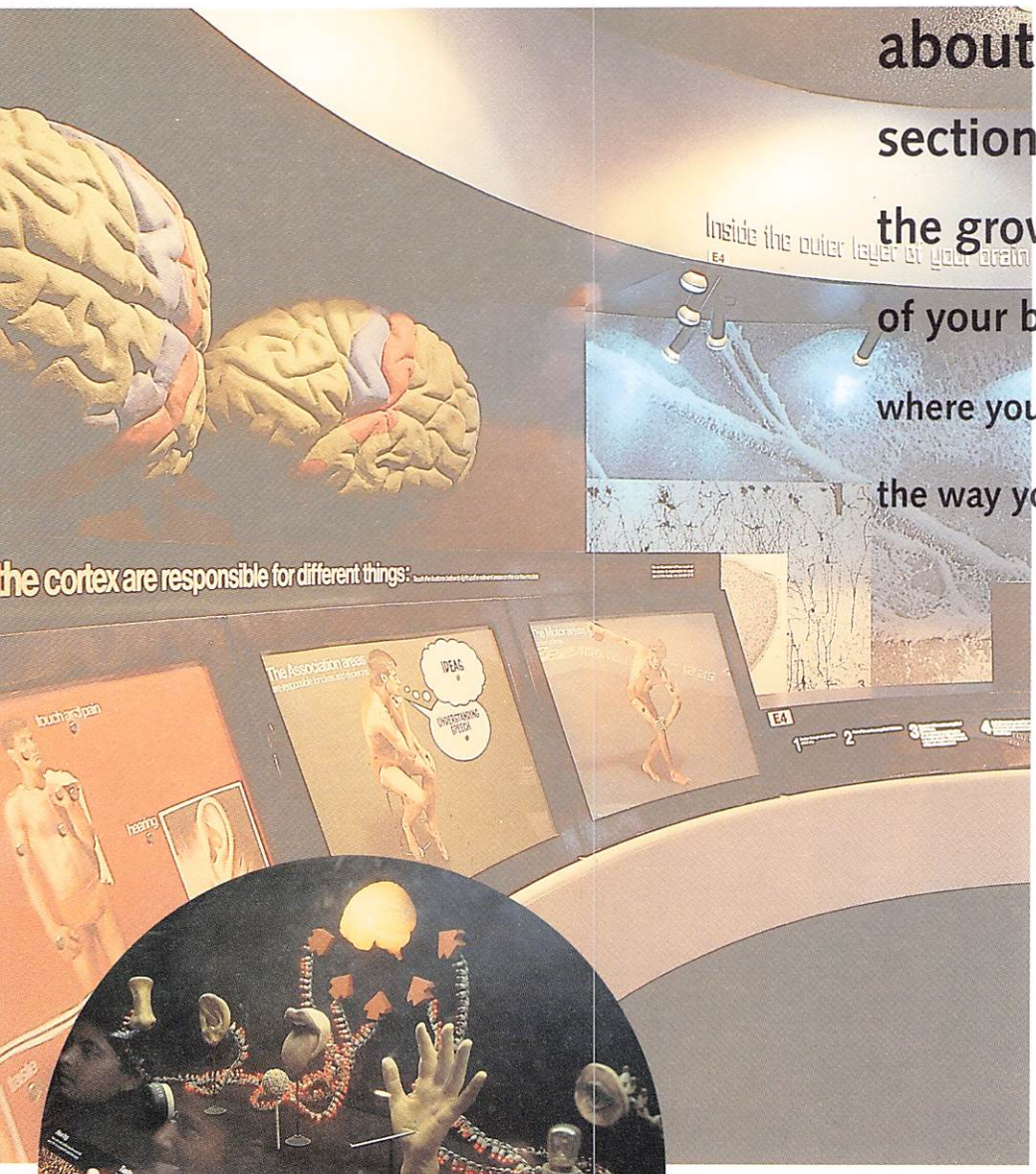
Artiodactyls are adapted to a wide range of habitats. Those living in the Arctic tundra, musk oxen for example, must keep warm, so they have thick fur coats. Camels survive the heat of the desert by possessing a remarkable system that allows their body temperature to drop during the cool desert night so they begin each day with a lower than normal body temperature. To live mainly in water, hippos have small eyes set high on the skull and nostrils that can be closed. They can hold their breath for as long as four minutes!
On the balcony you will be able to discover more about the mammals which spend all their lives in water. Most of this area is devoted to cetaceans, which include whales, porpoises and dolphins.

Here you can listen to songs of different whales, follow their migrations and uncover some of the possible reasons why whales lose their way and become stranded.
Dolphins hunt for their food by sending out clicking sounds and picking up the echoes. A computer exhibit shows how they do this. Other displays contain information about how these fascinating animals breed and the importance of their colours.
Also on the balcony is a video of sirenians, or sea cows. Their strange shape led many early sailors to mistake them for mermaids.
The second part of this exhibition, which is planned to open in 1991, will explore the diverse lifestyles of marsupials, bats and rodents as well as the popular carnivores, including the big cats and bears.

The Natural History of the Primates by J R & P H Napier
Mammal evolution by R J G Savage & M R Long
On the track of Ice Age mammals by Antony J Sutcliffe
A Natural History of Domesticated Mammals by J Clutton-Brock

HUMAN

Below: Discover how different areas of the brain cortex control our actions



This exhibition is about you. It has sections that tell you about the growth and development of your body and mind, and others where you are invited to think about the way you do things.

Our bodies are made up of millions of tiny units called cells but each of us began life as just a single cell - a fertilized ovum. A special slide programme traces the growth of a human embryo in the mother's womb, from this one cell to a fully-formed baby.

Circle: Information from the outside world reaches our brains through the senses

Fighting a deadly disease

Schistosomiasis is a disease which affects around 200 million people in 74 tropical and sub-tropical countries. It is caused by microscopic worms called schistosomes whose larvae develop in certain aquatic snails. After leaving the snails, larvae penetrate the skin of humans and animals exposed to contaminated water. The bladder and liver may be affected, resulting in the severely debilitating disease - bilharzia.
Different kinds of both schistosomes and snails are often extremely difficult to tell apart. Museum scientists use biochemical and molecular biological techniques to identify the different species and thus provide vital information for the control of the disease.

BIOLOGY

If you have ever wondered how you move, you will have the opportunity to study the bones in your skeleton, as well as the muscles that make bones move. You will also discover that it is nerves that make muscles pull.

Most of the nerve cells in your body are concentrated in your brain and spinal cord. Your brain controls almost all your actions and many of the things you do are in response to information gathered by your sense organs and nervous system. As well as gathering information from outside the body, your brain also receives messages from within it. It ensures that wherever you are and whatever you are doing, conditions inside your body, such as temperature, oxygen and water content, stay more or less the same.

Body processes are not only controlled by nerves. Hormones, chemical messengers carried in your blood, are also important. You can find out where in your body these substances are produced and something about the processes that they control, including growth, digestion and puberty.

All through our lives we learn about the world and store the experiences we have as memories. Exhibits show you that learning takes place all the time and changes the way we do things.

From the moment we are born we begin to explore. By constant interaction with our surroundings we discover more about the things around us.

As we grow older we develop new mental abilities that allow us to solve problems we have never encountered before, using reason and logic. By doing this our understanding of the world continues to grow...

Above: Model of an unborn baby, seven months after fertilization

Above from top: Does an elephant ever forget?

A lesson in language from extraterrestrials!

Muscle power moves bones

Find out where your glands are and which hormones they produce

Why Does My Heart Beat? by P Whitfield & R Whitfield

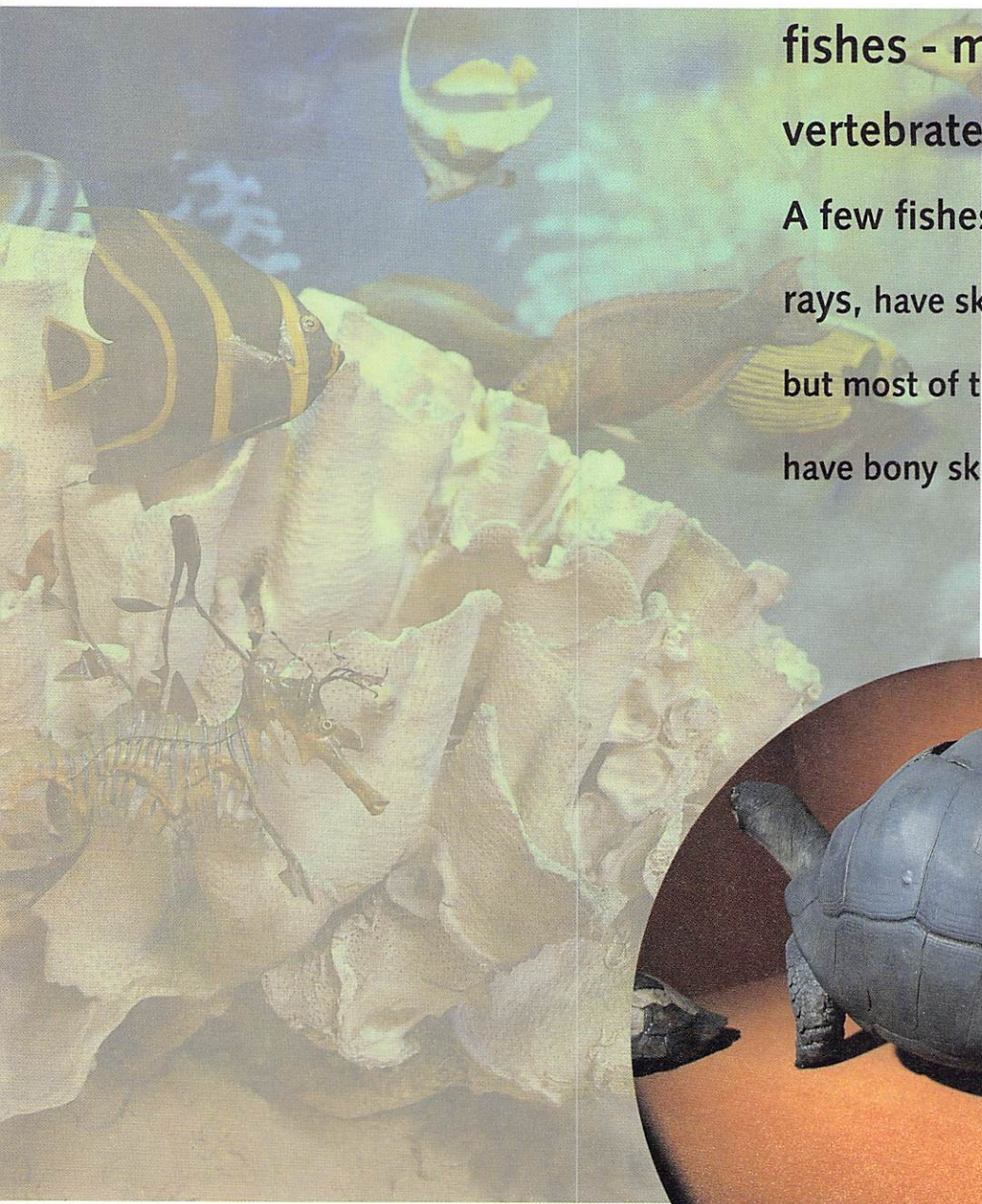
Human biology: an exhibition of ourselves

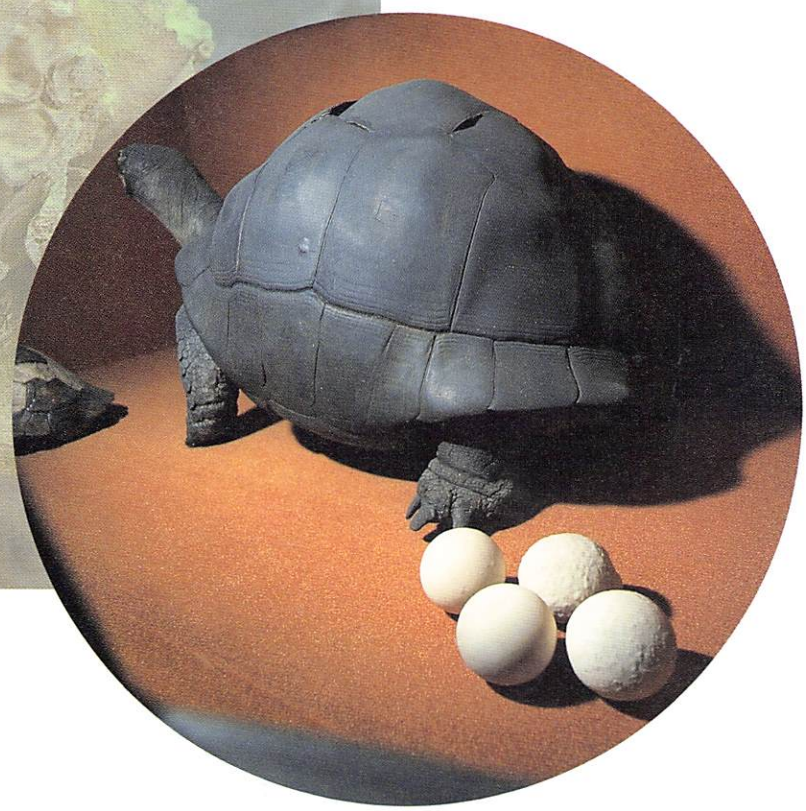
Life Before Birth

FISHES,

There are some 20 000 species of fishes - more than all other vertebrate animals put together.

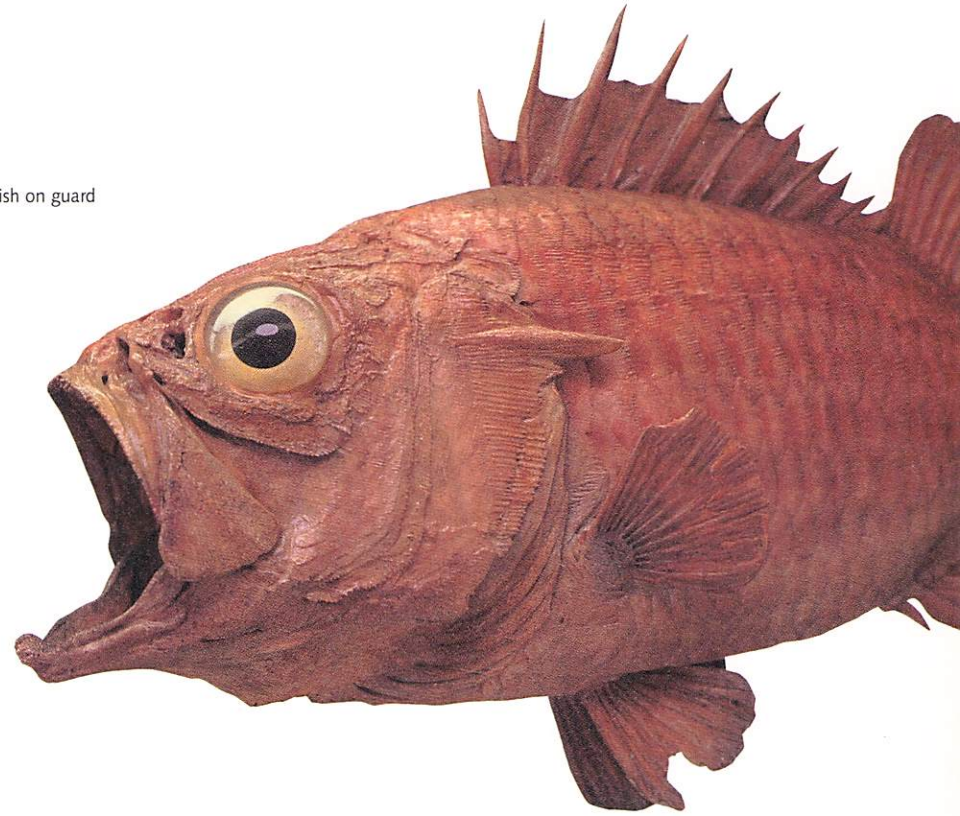
A few fishes, such as sharks and rays, have skeletons made of cartilage, but most of the world's familiar species have bony skeletons.





Above: The colourful inhabitants of a coral reef
Circle: A giant tortoise and its tennis-ball sized eggs

AMPHIBIANS & REPTILES



A soldier fish on guard

A display of the bony fishes shows the great variety within this group. You can also examine some unusual types, such as the flying fishes, the luminous and venomous species as well as the more familiar British marine and freshwater species.

In addition, there is an opportunity to see a coelacanth. Previously known only from fossils, coelacanths were thought to have been extinct for over 70 million years. But, in 1938, a trawler working off the coast of South Africa caught a fish which was later identified as a coelacanth - a living fossil! Since then over 100 specimens have been caught off the Comoro Islands, north of Madagascar and they have been filmed underwater.

Amphibians were the first vertebrate animals to live part of their lives on land, but their skin loses moisture easily and their eggs have no watertight shell. Consequently, all amphibians need access to water to breed.

Most people recognize frogs and toads as amphibians but newts, salamanders and worm-like caecilians are also included in this group. In fact, there are more than 4000 species of amphibians, most of which live in warm or tropical areas.

Reptiles do not depend on water for breeding because their eggs have a tough waterproof covering. With their relatively watertight skin, many reptiles, such as lizards and snakes, are able to live in areas where there is very little water.

Reptiles also include crocodiles, tortoises, terrapins, turtles and strange lizard-like animals from New Zealand called tuataras. Throughout the world, there are more than 6000 species of reptiles but only six are found in the British Isles.

Carpet killer

'Flying death of Rajputana' is one of the vivid names given to the brightly coloured and highly venomous carpet viper found in India and across central Africa. Carpet vipers cause more serious bites to humans than any other group of snakes, and consequently have attracted considerable medical attention.

Treatment, however, is not straightforward - anti-venom prepared in one place is often ineffective when used elsewhere. This fact led scientists to suspect that carpet vipers from different regions, although virtually indistinguishable, produced different venom and might belong to separate species. By carefully comparing the anatomies of African and Asian carpet vipers, Museum scientists have now confirmed the species difference. It is hoped that this anatomical approach, combined with chemical studies of carpet viper venoms will lead to the development of more effective anti-venoms.

Far left: It is safe to smile at this crocodile!
Left: White striped poison frogs from South America

'CREEPY -

This exhibition focuses on arthropods, the animal group that includes centipedes, crabs, spiders and insects.

Eight out of ten living animals are arthropods and there are more species of insects than all other animals put together. Here you will see why arthropods are such a diverse and successful group.

Arthropods are extremely adaptable animals. Different members of the group can feed on almost anything from blood to paper using specially adapted limbs and mouthparts.

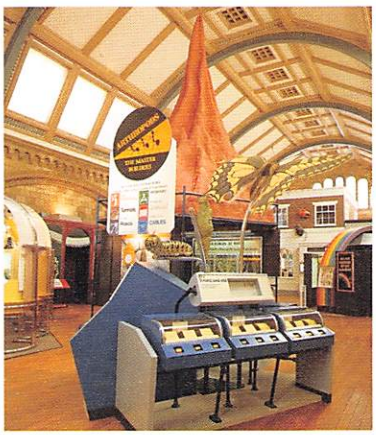
Another factor contributing, in particular, to the success of insects is that young and adult animals may have completely different lifestyles. Caterpillars and adult butterflies, for example, have different diets and therefore do not compete with each other for food supplies. The immature form is transformed into an adult during a process called metamorphosis and the exhibit 'Changes' shows some fascinating film of this.

Many arthropods build nests but none are more spectacular than those of termites. A lifesize model of a termite mound with its underground nest and giant tower above is at the centre of the gallery. If you would like to see some live insects living in complex societies there is a nest of fungus-growing ants in 'Insect societies'.

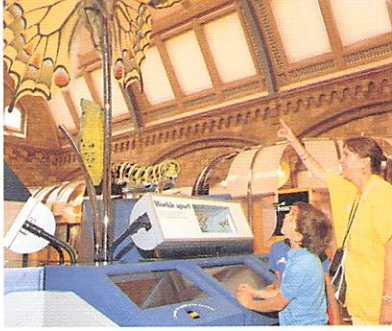
LONDON ZOO

Above: Fascinating fungus-growing ants
Circle: Dare you enter 1 Crawley House?

CRAWLIES'



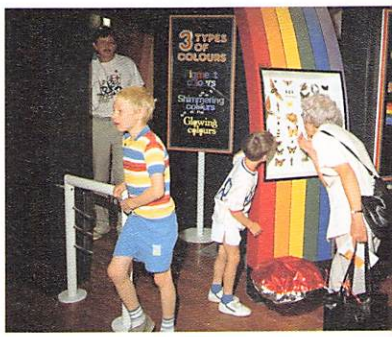
Left: Life-size termite mound rises high into the gallery



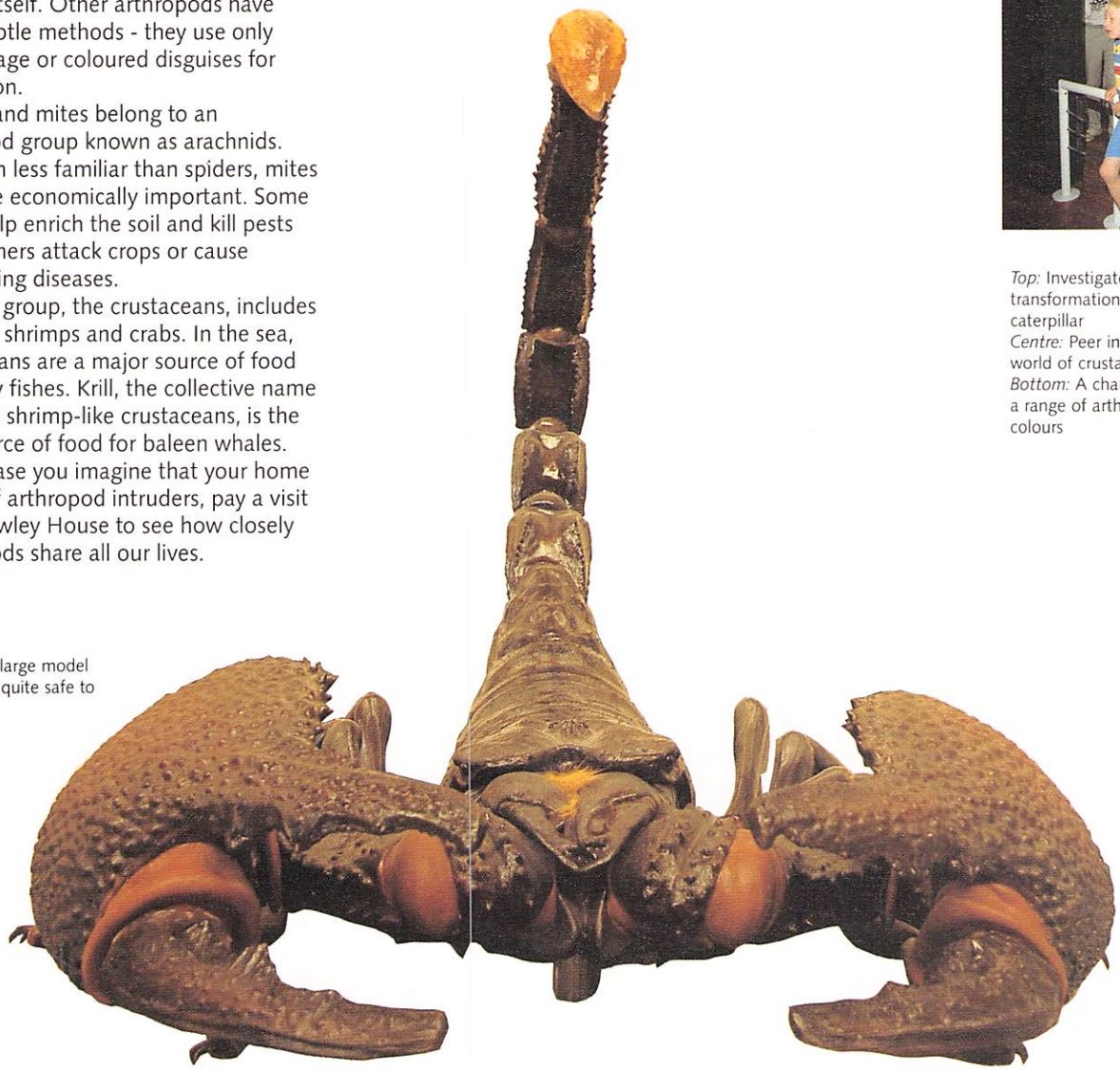
Deadly stowaways

The presence of live spiders, and even scorpions, in consignments of imported fruits, especially bananas and grapes, is becoming an increasing problem. In the summer of 1988 thousands of pounds worth of Californian grapes were destroyed by British supermarkets because of a black-widow spider scare. Although the variety of imported tropical fruit has increased, one important reason for the greater incidence of such spiders is a reduction in the use of pesticides.
In order to assist with this problem, the Museum offers an identification and advisory service to producers, wholesalers and retailers. This kind of work is expected to lead to practical courses that will enable people from the fruit trade to become familiar with some of the exotic species and to recognize the dangerous ones.

To protect themselves, some arthropods have evolved a fearsome array of weapons. A scorpion, for example, has claws, an armoured body and a poisonous sting to defend itself. Other arthropods have more subtle methods - they use only camouflage or coloured disguises for protection.
Spiders and mites belong to an arthropod group known as arachnids. Although less familiar than spiders, mites are more economically important. Some mites help enrich the soil and kill pests while others attack crops or cause debilitating diseases.
Another group, the crustaceans, includes lobsters, shrimps and crabs. In the sea, crustaceans are a major source of food for many fishes. Krill, the collective name for small shrimp-like crustaceans, is the sole source of food for baleen whales.
Just in case you imagine that your home is free of arthropod intruders, pay a visit to 1 Crawley House to see how closely arthropods share all our lives.



Top: Investigate the transformation of a caterpillar
Centre: Peer into the world of crustaceans
Bottom: A chance to see a range of arthropod colours



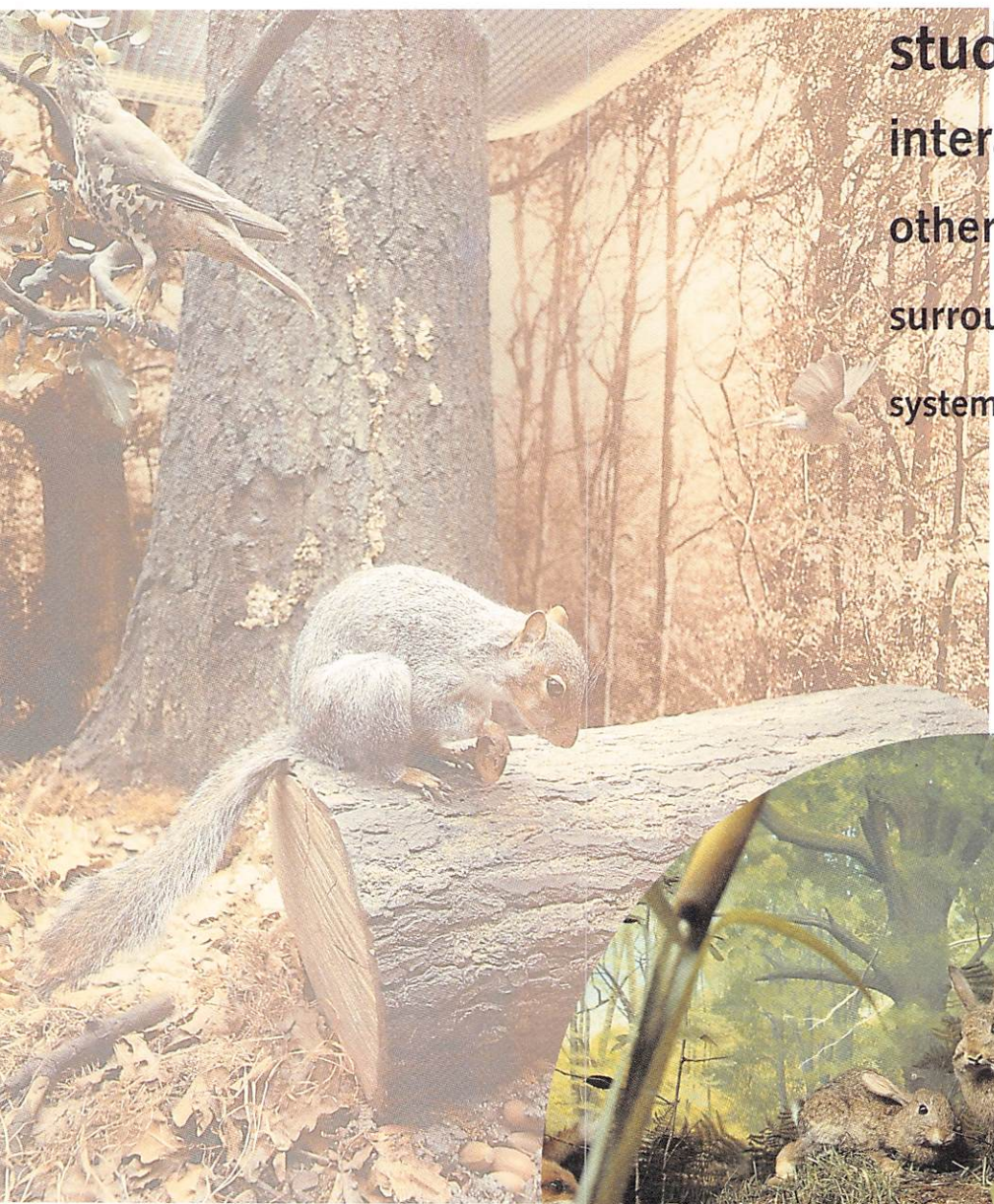
Right: This large model scorpion is quite safe to approach

Butterflies and Moths in Britain and Europe by D J Carter
Ladybirds & lobsters, scorpions & centipedes

INTRODUCING

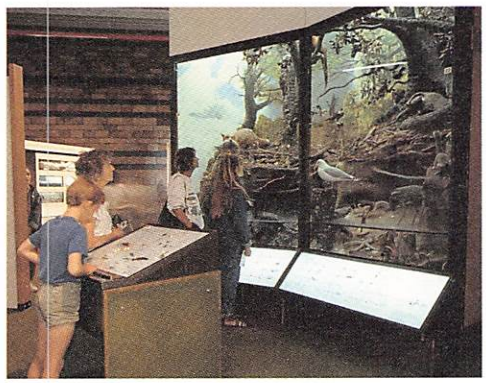
Ecology is the study of living things interacting with each other and with their non-living surroundings to form natural systems, or ecosystems.

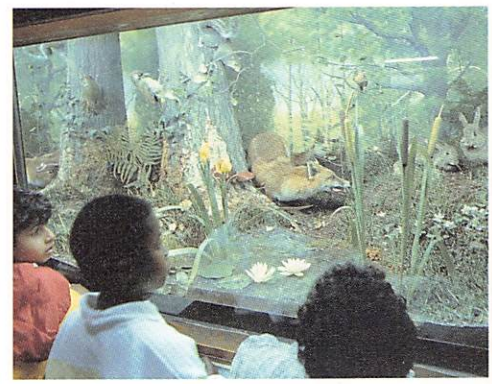
This exhibition looks at the ways in which these complex networks operate, using two familiar British ecosystems - an oak woodland and a rocky seashore - as examples.



Above: Grey squirrels bury many more acorns than they will eat
Circle: In this ecosystem, rabbits are primary consumers

ECOLOGY





Above left: Try solving the complexities of a food chain
Centre: There are plenty of 'hands-on' exhibits to try
Right: Take a close look into a woodland

It begins by considering energy that all living things need for survival. Light energy from the Sun is captured by green plants and converted into stored chemical energy by a process called photosynthesis. Animals cannot use the Sun's light energy directly - they obtain the energy they need either by eating plants, or by feeding on other animals that have eaten plants. Those that feed on plants are called herbivores, and animals that consume other animals are called carnivores. Omnivores have a diet which includes both plants and animals, and decomposers, organisms such as fungi and bacteria, feed on dead and decaying matter in the ecosystem. Every plant and animal can be thought of as a link in a food chain and each time an animal eats or is eaten, energy is transferred along the food chain. The energy relationships of the animals and plants in both woodland and seashore ecosystems are crucial to their continued survival. Ecologists study the differences in ecosystems by looking at the way in which energy is transferred between living things. To do this, they group organisms into categories called trophic levels. At the end of the exhibition you can find out how studying trophic levels is important in helping to maintain the delicate balance of the world's ecosystems.

Monitoring acid rain

Lichens, living associations of fungi and algae, can be found growing on trees, rocks, roofs and gravestones in Britain. During this century there has been a marked decline in their numbers and studies have confirmed that this is related to an increase in atmospheric pollution. Lichens are particularly sensitive to sulphur dioxide, a by-product of the burning of coal and oil. This discovery has led to the widespread use of lichens in the detection of acid rain - rain contaminated with sulphur dioxide.
Since 1986, Museum scientists have been involved in a project, commissioned by the Nature Conservancy Council, to set up a monitoring system for acid rain using lichens. They hope to relate changes in lichen communities to the levels of acidity in rainfall. The resulting statistics about the effects of acid rain may prompt governments to act against the problem.

Lichens and air pollution by P W James
Nature at Work: Introducing Ecology
Observing British and European Mammals by C Bouchardy & F Moutou
What is a Rain Forest? and other questions about Conservation and Ecology by P Whitfield
Finding and identifying Mammals in Britain by G B Corbet

ORIGIN OF

Below: Model of Charles Darwin and his study
Circle: 'A mutant in my garden!' Peter Collinson's peach tree suddenly produces a nectarine

Have you ever wondered how there came to be so many different species on Earth?

One explanation is that evolution, a process of gradual change over millions of years, has produced this enormous diversity.

Charles Darwin was one of the first people to propose a convincing theory which could account for changes within species that might eventually give rise to new species. In 1859 he published a book entitled *On the Origin of Species by Means of Natural Selection* and it is the process of natural selection that is explained in this exhibition.

Darwin had observed domestic or artificial selection at work in the breeding of plants and animals. By deliberately selecting certain characteristics in the individuals that are to be bred, people are able to produce changes in a wide variety of plant and animal species. In the exhibition, you can see how new kinds of dogs have been bred in this way.

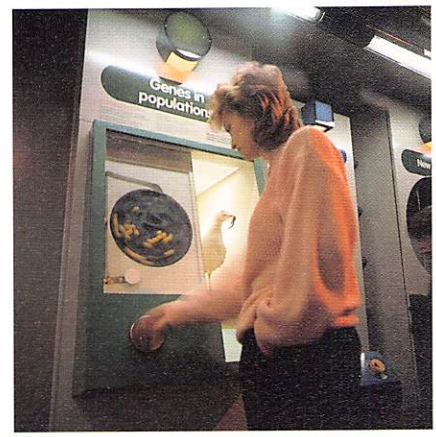
SPECIES

Left: Breeders have produced different types of dogs by a process of selection over many generations
Centre: Survival of the fittest - who catches the worm?
Bottom: It was once thought that egg and sperm cells contained miniature replicas of the adults that produced them

Death defying aphids

Despite their innocuous appearance, aphids (greenfly) pose a serious threat to agriculture. Great numbers of them devour our crops, often spreading plant viruses as they go. Aphid pests come in many varieties - some of which only attack specific crops. Museum scientists have helped to identify and distinguish between these pests by studying the arrangement of their genes.
Faced with swarms of voracious aphids, agriculturalists have traditionally sprayed them with insecticides. However, after some time, they noticed that the number of surviving aphids was increasing. Aphids were becoming resistant to chemical sprays. One Museum scientist investigating this phenomenon discovered that the genetic material of the resistant aphids was unusual - some of it had altered, producing vast quantities of chemicals which neutralize the insecticide.
Further studies of this phenomenon will lead to more effective design and use of insecticides.

If an individual inherits a characteristic that makes it better adapted to its environment than other members of its species, it will have a better chance of survival. One example shown in the exhibition is that of a mouse with dark fur. Dark fur may provide better camouflage from predatory owls than light fur. The dark mouse will thus be more likely to survive to reproduce than its paler coloured relatives, and over several generations the proportion of dark mice in the whole population will increase.Because environments differ from place to place and may vary with time, over thousands of generations populations may adapt and change again and again. In some cases a population may become geographically divided and the separated groups change so much that they eventually become separate species.



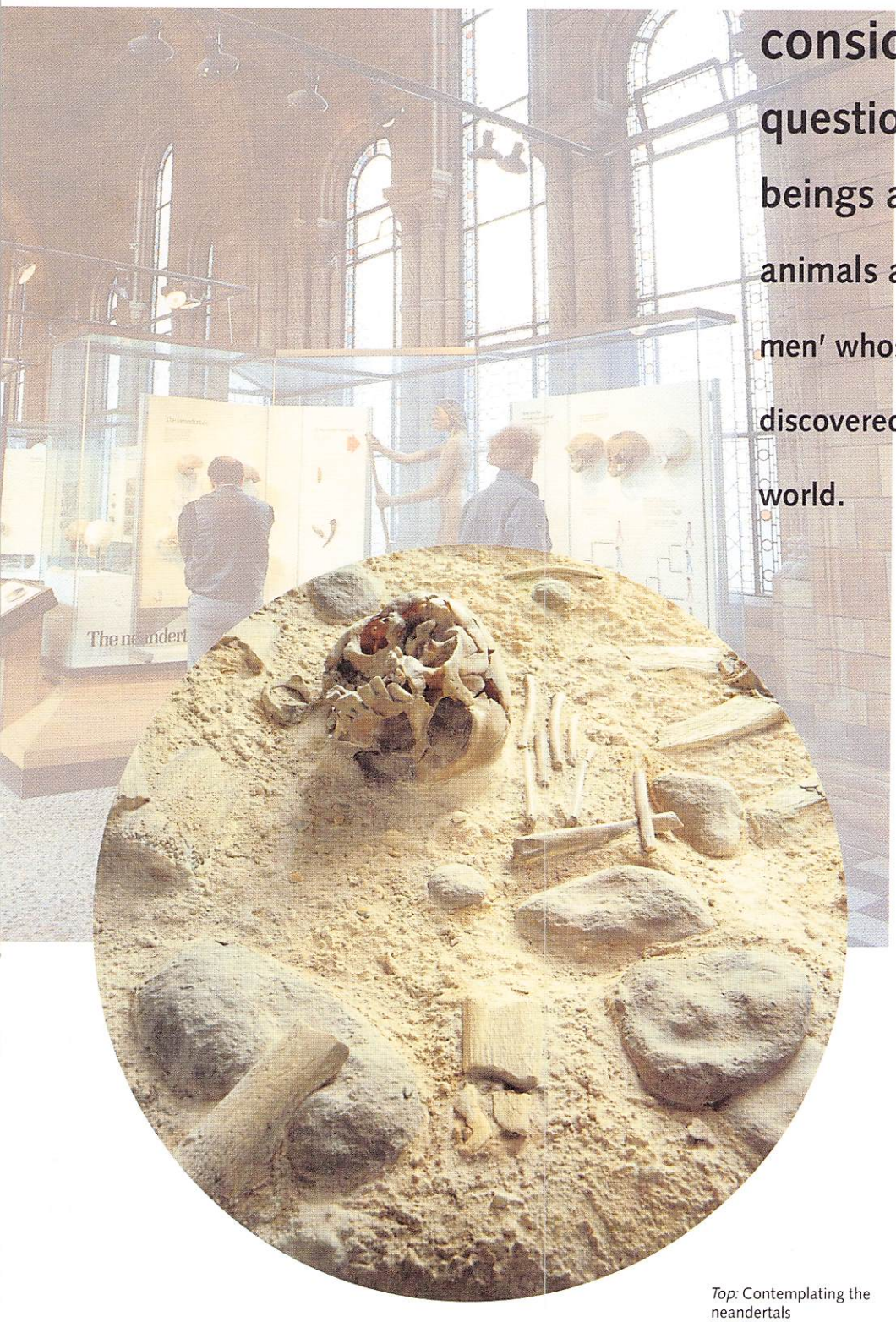
Above: New genes can be brought into a population by migration and removed by selection
Below left: Discover what natural selection is and how it works

Darwin developed his theory from several other observations of species. He noticed that all living things can produce far more offspring than are needed to replace them, but not all the offspring survive to reproduce.
Living things must compete for limited resources, such as food and space. Sometimes it is a matter of luck which survive and which die. But because no two members of a species are exactly alike, some may have an advantage over others. This advantage may be controlled by the environment or by genes, which are passed on from one generation to the next.

Origin of species
Dogs of the Last Hundred Years by K Dennis-Bryan & J Clutton-Brock
Evolution by C Patterson

MAN'S PLACE

This exhibition considers the question of how human beings are related to other animals and the various 'fossil men' whose remains have been discovered in different parts of the world.

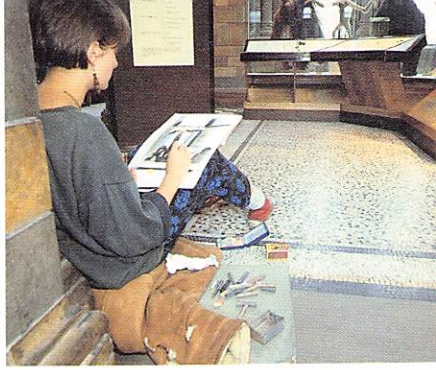


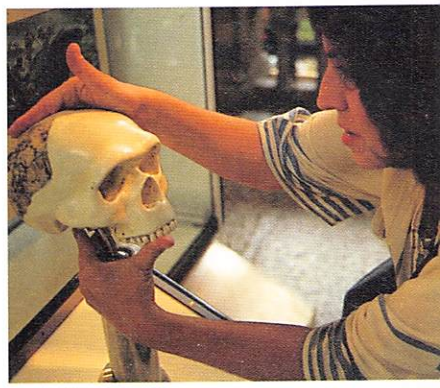
In order to consider these relationships, we must look closely at our own characteristics and then investigate whether or not they are shared by any other animals, living or extinct.

The evidence suggests that chimpanzees and gorillas are probably our closest living relatives because they share more of our characteristics than any other mammals. But neither of these animals walks upright and, for their size, they do not have such large brains as humans. So, we must look for closer relatives amongst the fossils. In the main part of the exhibition you can consider the evidence from different fossil groups. The australopithecines lived in Africa between 5 and 1.5 million years ago. From their skeletons we can tell that they were able to walk upright and were therefore more closely related to humans than chimpanzees and gorillas. Another group, the habilines, lived between 2 and 1.5 million years ago. They had larger brains than australopithecines and made a variety of tools. For this reason, habilines are thought to be even more closely related to us and are given the scientific name *Homo habilis* or 'handy man'.

Top: Contemplating the neandertals
Circle: Reconstruction of a neandertal burial based on remains found at Teshik-Tash, USSR

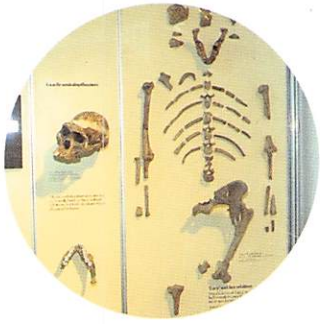
IN EVOLUTION



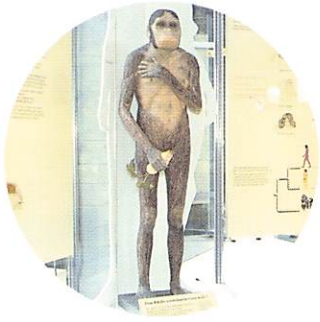


Top right: What do you make of our closest living relatives?
Bottom: Feel the dent on the back of the neandertal skull

Left: Could this fossil ape be more closely related to us than other living apes?



'Lucy', the most famous australopithecine, was found in Ethiopia in 1974



Reconstruction of adult female australopithecine

Neandertal woman fashioning a spear

Another unique human characteristic is our use of fire for heating and cooking. *Homo erectus* people, whose remains have been found in the Far East were probably the first people to use fire. These people were taller than habilines and had larger brains so they are thought to be more closely related to us than the habilines.

But our closest known fossil relatives are the neandertals, people who lived in Europe and the Middle East between 150 000 and 40 000 years ago. They had larger brains than *Homo erectus* people, they made tools, used fire and buried their dead.

By about 100 000 years ago people like us were living in Africa and the Middle East, and by 30 000 years were inhabiting much of the world. Paintings made by these early people have been found in Africa, Asia, Europe and Australia and evidence suggests that they found food by hunting, but later began to cultivate crops and keep animals. Their early farming communities were the beginnings of the towns and cities of our modern world.

The origin of modern people

Despite differences in appearance, all people alive today are members of the species Homo sapiens. *What is less certain, however, is how modern humans originated. Some scientists think that we evolved from several different ancestors around the world and that gradually they intermixed and developed into modern humans. Others, including Museum scientists, believe that modern humans originated in one area only and then dispersed.*

Powerful support for the idea of a single origin for modern people has been obtained from studying fossils and genetics. The fossil record shows that modern-looking people were present in Africa 50 000 years before they appeared in Europe and the Far East, so Africa is thought to be the source of modern humans. This theory is supported by genetic evidence as modern African populations have a greater genetic diversity than European, Asian and Australasian populations. Since genetic diversity is a measure of the age of a population, this fact supports the theory that modern Homo sapiens *originated in Africa.*

Man's place in evolution 2nd ed.
Human Evolution - an illustrated guide by P Andrews & C Stringer
Digging Up Bones 3rd ed. by D R Brothwell

MAMMAL

Top: Unlike most wolves, the maned wolf hunts alone
Bottom: The fox-like face of a fruit bat

The mammal balcony is a very popular area of the Museum, especially with artists who come to sketch the great variety of mammal species to be found there.

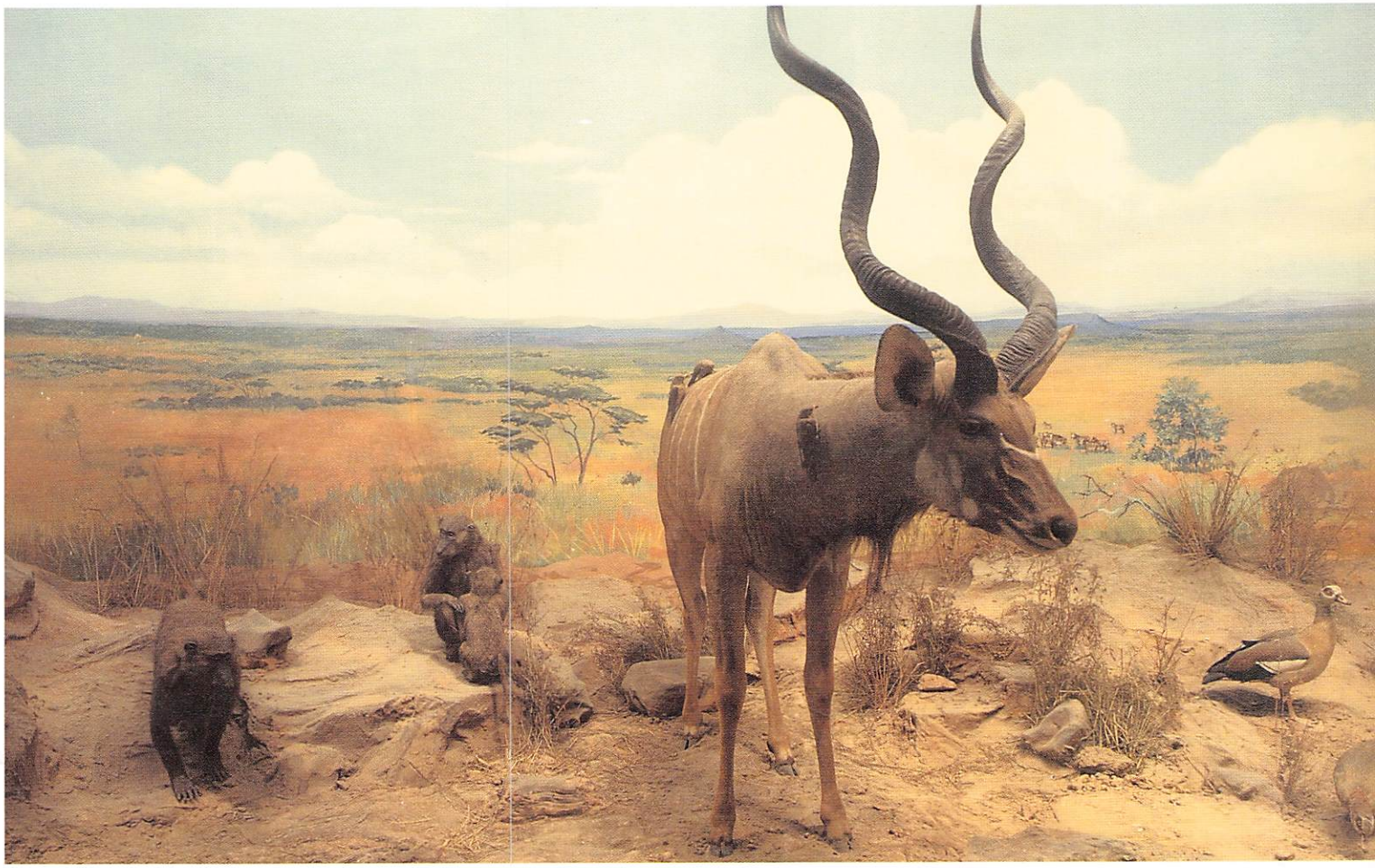
Right: A mountain gorilla and some of its relatives

Many of the specimens are of historical as well as scientific interest. The bison is one of the oldest on display. It was acquired by the Museum in 1846 and is believed to have been hunted by the famous American artist J J Audubon. Today, the Museum obtains new specimens only from zoos or essential culls.

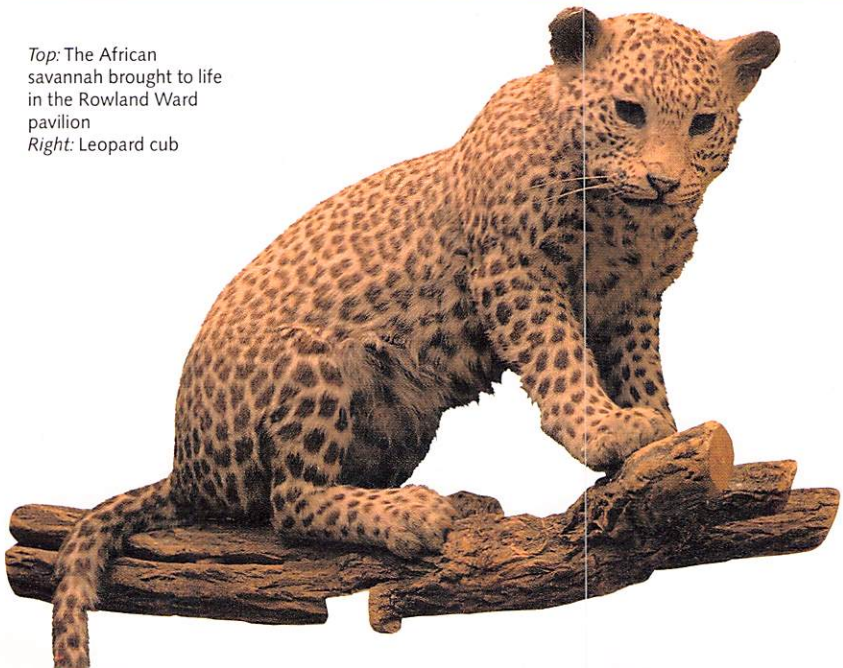
New World monkeys, primates, marsupials and some of the hoofed mammals are also to be found here. Along the balcony, there is a special display devoted to carnivores in danger of extinction, including the Chinese tiger, clouded leopard and beautiful maned wolf.
On the same floor, at the end of the *Origin of species* gallery, is the Rowland Ward pavilion. Opened in 1960, it commemorates James Rowland Ward, a distinguished taxidermist, who left many specimens to the Museum on his death. Three African scenes are depicted - a waterhole in northern Kenya, a grassland in Angola and a central African forest where you can see two rare and secretive animals, an okapi and a bongo.

Circle: Head to head with an American bison

BALCONY
AND ROWLAND WARD PAVILION



Top: The African savannah brought to life in the Rowland Ward pavilion
Right: Leopard cub



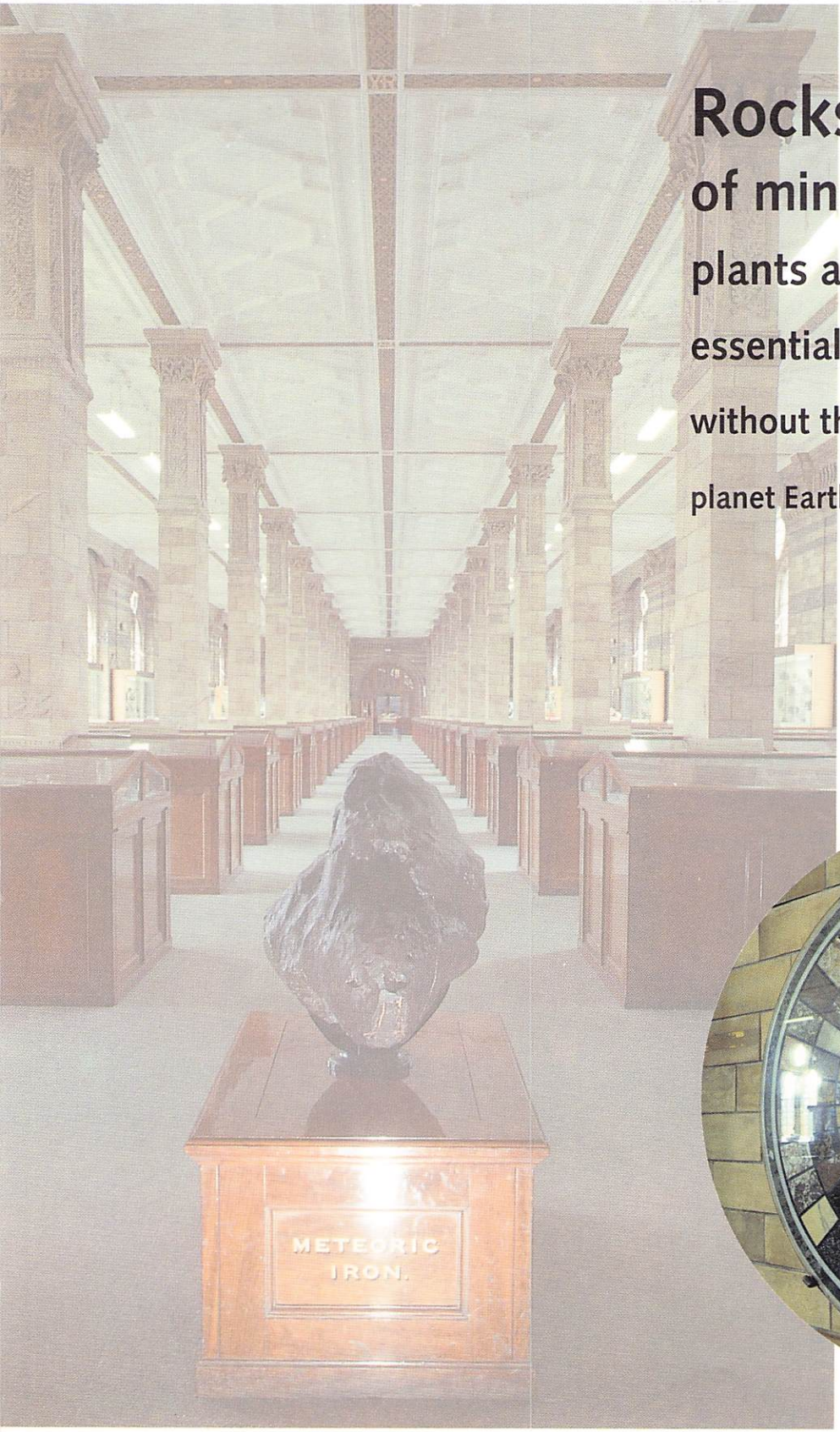
Anything to declare?

Every year thousands of rare animals are sacrificed to the trade in luxury goods. Ivory knives, tortoise-shell earrings and leopard-skin handbags are examples of these costly products. Despite punishments as severe as the death penalty in some countries, the illegal trade still flourishes. Manufacturers often disguise the fact that endangered animals were used to make their products by dyeing skins and furs and cutting them into thin strips. Ruses like these hinder customs officials from charging the traders.

For help, customs officials turn to Museum scientists, who can compare the product with specimens in the collections. If confirmed as deriving from an endangered species, it is confiscated and sometimes destroyed, and the trader charged. While too late to save the animal, this process acts as a deterrent and helps in the prosecution of illegal importers.

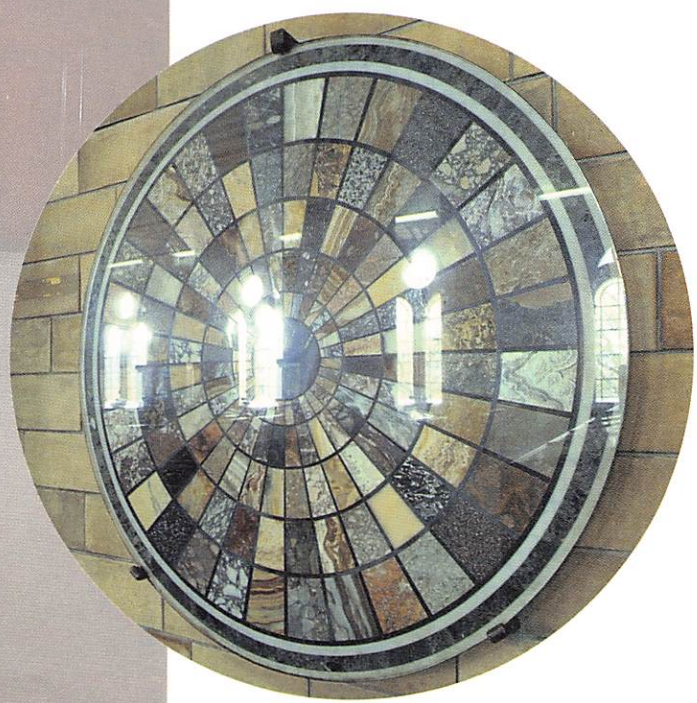
Below: Slice of the Mundrabilla iron meteorite found in Western Australia in 1966
Circle: Remarkable table top of ancient Roman marbles

MINERALS,



Rocks are composed of minerals which, like plants and animals, are an essential part of natural history - without them there would be no planet Earth and no life upon it.

Minerals and rocks have been represented in the British Museum's collections since its formation in 1753.



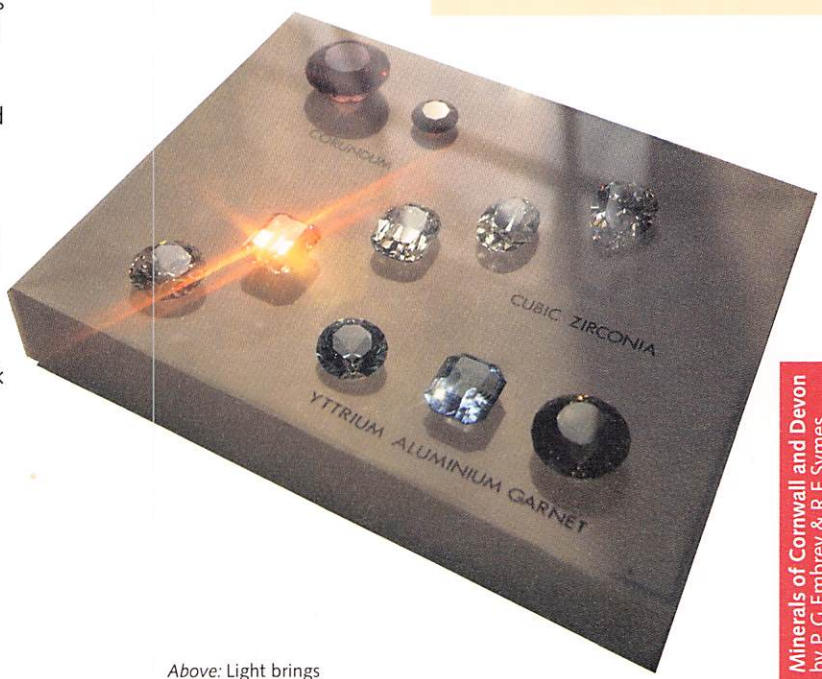
ROCKS & METEORITES

Above left: Sulphur from Sicily
Right: The striking colours and patterns and relative softness of jaspar make it popular for carvings

Near the entrance to the mineral gallery, where the science of mineralogy is introduced, there is a collection of mineral curios donated by the founder of the British Museum, Sir Hans Sloane. These unusual bowls, rings and ornaments were transferred to South Kensington in 1881.
The main part of the gallery is occupied by cases of minerals displayed according to their chemical composition and structure. About 3000 different minerals are known and new ones are discovered each year. They come in an amazing variety of colours and shapes.
Gemstones are minerals that are cut and prized for their beauty and durability. Throughout the gallery there are some exquisite examples of fine crystals and gemstones. And, should you wish to see more, there is another fine collection on display in the *Gemstones* exhibition.
At the far end of the gallery is the popular meteorite pavilion. The Earth is continually bombarded with natural rock fragments from space. Most burn up in the atmosphere, producing 'shooting stars' but if they reach the Earth's surface they are known as meteorites. Altogether about 4000 different meteorites have been recovered and pieces of about half of these are in the Museum's collections.

The poor man's space probe

How did the Earth, sun and planets form? The study of meteorites is central to the attempts of scientists to answer this question.
Most meteorites are fragments of asteroids (small planets) and have not been changed since the Earth was formed, 4550 million years ago. Some meteorites contain dust from stars which appeared near our sun at about the same time. By studying the chemical composition of meteorites, Museum scientists are beginning to understand the processes by which our sun, the Earth and other planets were formed. Because meteorites are samples of objects from space where few people have the chance to go, they have often been called 'the poor man's space probe'.



Above: Light brings gemstones to life

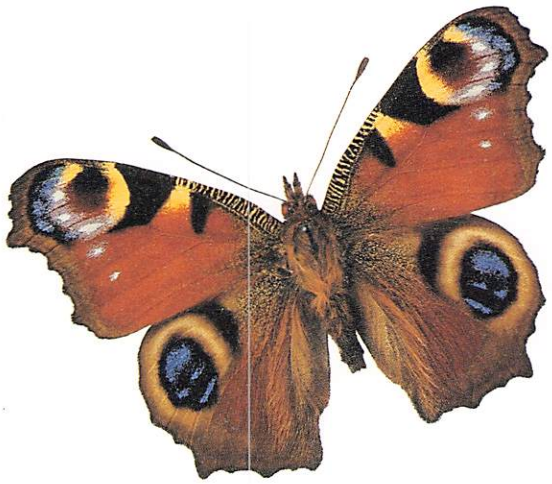
Minerals of Cornwall and Devon by P G Embrey & R F Symes
Meteorites: Key to our existence by Robert Hutchison & Andrew Graham
Gemstones by C M Woodward & R R Harding
The search for our Beginnings by R Hutchison
Minerals of the English Lake District, Caldbeck Fells by M Cooper & C Stanley

BRITISH

Below: A family faces up to a pair of seals
Circle: Which of these fungi are good to eat and which are poisonous?

This exhibition was specifically designed for the amateur naturalist and countryside enthusiast.

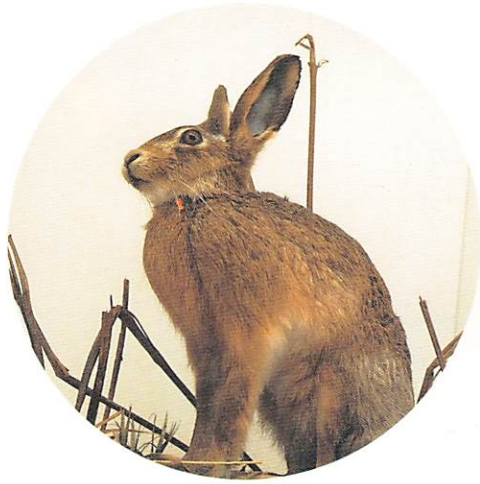
NATURAL HISTORY



The gallery depicts a wide range of habitats, and features - as specimens, models or photographs - many of the animal and plant species found in Britain.

An introductory area traces changes in the British landscape, plants and animals from the last Ice Age, 20 000 years ago, to the present day. It then looks at the impact of human beings on the environment and suggests ways in which we can conserve natural habitats. Another exhibit introduces the principles of identification and gives you the chance to identify some real plants and animals.

The main exhibition, up the stairs, is divided into seven areas. These correspond to the major habitats recognized in Britain today: woodland; seashore; urban and wasteland; freshwater; field and downland; heath, moor and highland; and estuary, saltmarsh and sand dune. Each section shows some of the characteristic wildlife of that habitat as well as giving useful environmental information.



Top: Foxes are now a familiar sight in many cities
Bottom: The springtime courtship behaviour of brown hares gave rise to the saying ' ...as mad as a March hare'

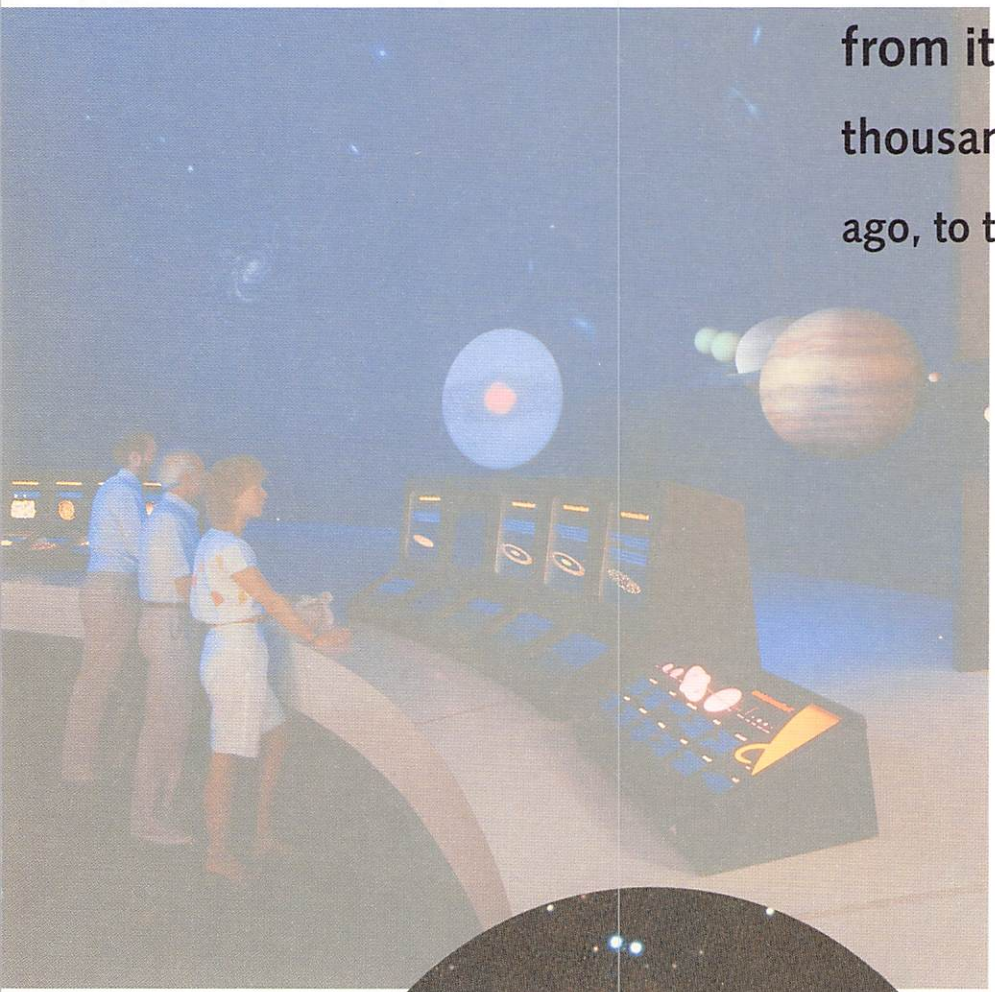
A fishy tale

The River Thames has been an integral part of London's development as a city for nearly two thousand years. During this time the river has been put to a variety of uses, mainly to its detriment. The enormous increase in London's population in the 1800s sealed the river's fate. Untreated sewage and industrial waste were pumped directly into the river and soon large reaches of the Thames were almost devoid of fish.
Although initial attempts to treat London's sewage resulted in some species of fish returning, a survey by a Museum scientist in 1957 revealed that there was no established fish population between Kew and Gravesend - a distance of over 60 kilometres.
Efforts made to clean up the Thames were again monitored by the Museum between 1967 and 1973. Around 100 species of fish were found living in the tidal reaches of the river. Today the Thames is probably cleaner than at any time in the last 400 years and is now home to about 130 species of fish, including salmon.

Bats: a natural history by J E Hill & J D Smith
Seals of the World 2nd ed. by J E King
Two Hundred Years of British Farm Livestock by S Hall & J Clutton-Brock
Finding and Identifying Mammals in Britain by G B Corbet

STORY OF THE

This exhibition tells the story of our planet from its formation in the stars, thousands of millions of years ago, to the present-day.



The entrance to the exhibition is through a dramatic rockface, cast from a road cutting in the Highlands of Scotland. The rock is metamorphic rock which formed one thousand million years ago, under the sea that originally covered northern Britain.

The story begins in outer space as the Earth was formed from elements in exploding stars. You can get some idea of Earth's place in the Universe by looking at the millions of other galaxies that surround us and then at our own. Within our galaxy is one star, our Sun, and orbiting around the Sun are the planets of our Solar System.

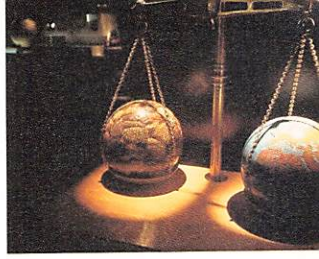
A little nearer is Earth's natural satellite, the Moon. In a separate exhibit you will find a sample of Moon rock which has been lent by NASA. Part of the rock is feldspar which is 4000 million years old - older than any rock known on Earth.

The Earth today is by no means unchanging. Large sections of its outer layers called 'plates' move small distances each year, eventually causing the formation of mountains and shaping of continents. The theory of 'plate tectonics', which explains these movements and their consequences, is explored in the exhibition.

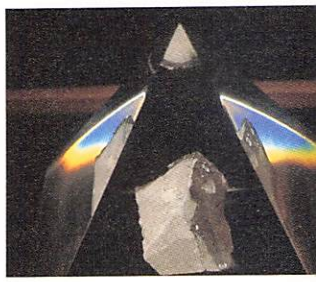
The geology and fine details of the Earth's crust are affected by processes such as erosion, weathering and sedimentation. These are usually slow and undramatic. In contrast, volcanic eruptions can be sudden and devastating.

Above: Out of this world
Circle: The Crab Nebula, remains of a supernova blast

EARTH



Above: Weigh up the Earth's story for yourself
Below: Original moon rock



Left: Discover our planet's inner secrets

When a volcano erupts, magma - semi-molten rock from below the ground - is forced out from inside the Earth. Earthquakes, which can also produce dramatic changes, are caused by sudden movements or fractures of the Earth's crust that can occur at the edges of plates under pressure. You can experience how an earthquake feels in the exhibition's earthquake room.

Opening in 1990 on the mezzanine above *Story of the Earth*, there will be a new exhibition, dealing with geological time. It will highlight some of the ways in which the world has changed during its long history. A 'time machine' will carry visitors back 4000 million years, close to the origin of the Earth, stopping on the way to visit the first animals and plants, the coal forests and the dinosaurs, before returning to the twentieth century.

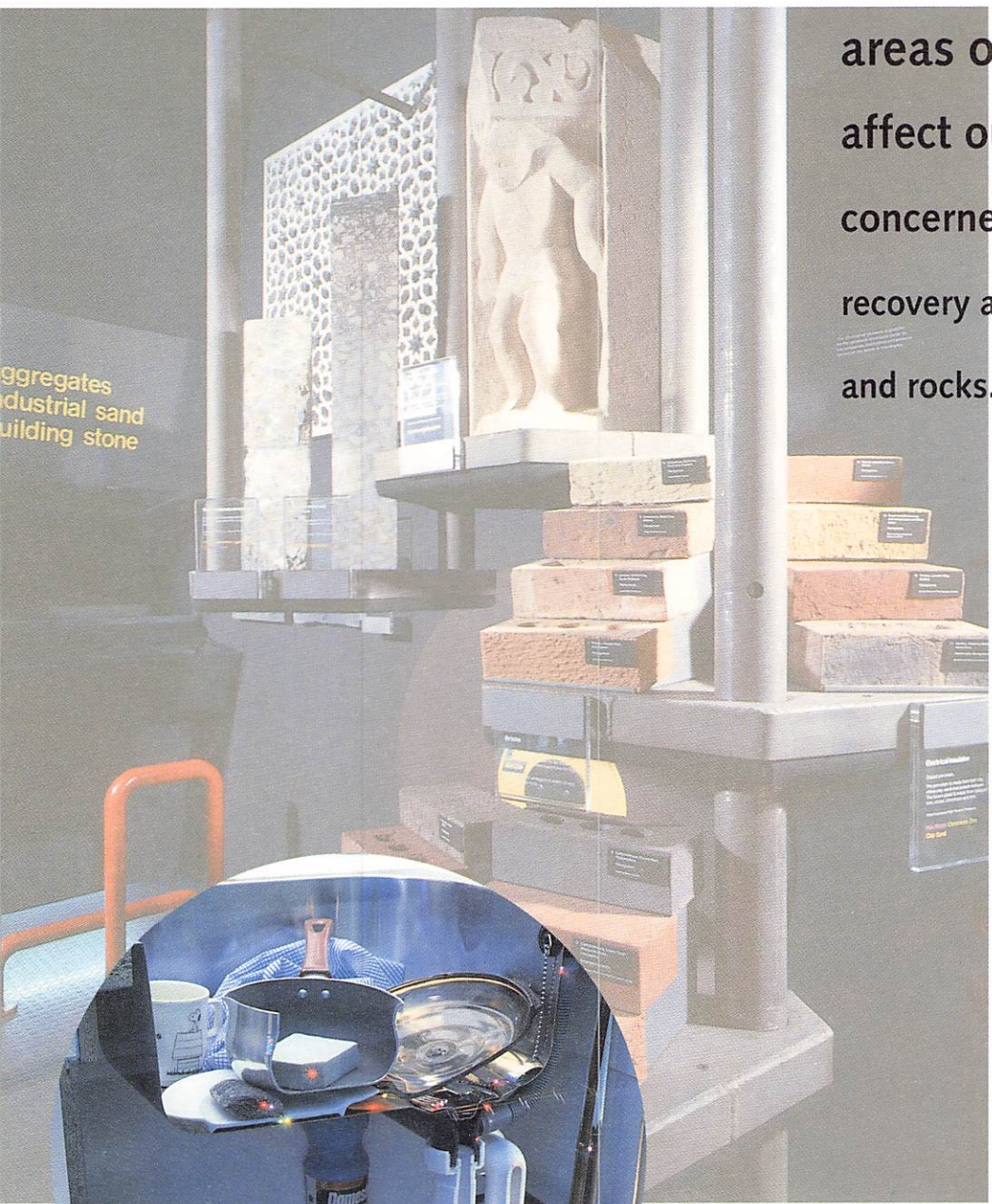
Far left: Not of this Earth but part of its history
Left: Explore the Earth's fiery interior

The Story of the Earth by F W Dunning
The Age of the Earth by J C Thackray
Volcanoes by S van Rose & I F Mercer
Earthquakes by S van Rose

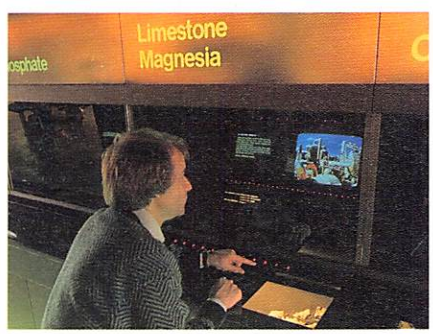
TREASURES OF THE

Treasures of the Earth examines the areas of geology which affect our lives - those concerned with the discovery, recovery and use of minerals and rocks.

The central feature of the exhibition is a house which demonstrates just how and where we use these substances obtained from the Earth.



Above: Minerals have many important uses
Circle: Discover the mineral treasures in your kitchen...or car (top right)



Above: Pick a mineral and discover its secrets

EARTH

Left: The floor has surprises too...
Below: Almost everything we use contains treasures from the Earth

Restoring old buildings

The Natural History Museum houses one of the greatest historical collections of building stones in Europe. Museum geologists make commercial use of this enormous reference collection by offering consultancy services to groups concerned with building materials. Some of their most interesting work has been in the restoration of old buildings, such as Lincoln Cathedral, King's College Chapel, Cambridge, and Ightham Moat, Kent. Many of these early buildings were made of limestone, which weathers easily and may have deteriorated badly. The restorers turn to Museum geologists for help in finding replacement stones to match the colours and textures of the originals. By comparing the original stones with those in the collection, geologists can identify the type of stone and recommend a quarry where more can be found. In cases where the stone is no longer quarried or was unsuitable in the first place, they suggest an alternative material.

Above: Superb specimens in a high-tech setting

You can locate materials such as copper, clay, titanium and lead - all of which are to be found in a typical kitchen, garage or greenhouse.
An animated film portrays the different geological environments in which useful minerals and rocks are found. Many minerals are found as ores which must be dug up and purified and a large model shows the workings of a large modern mine.
Close by is a display of useful minerals, where you can inspect a collection of partly processed materials and domestic and industrial objects, from artificial hip joints to railway lines. All of these contain natural substances and any questions you have about where such minerals are found, extracted and used, can be answered at one of the computer-operated data banks.
A special section of the exhibition deals with the important fuels we obtain from the Earth - the fossil fuels coal, oil, gas and the nuclear fuel uranium.
Models explain how fossil fuels were formed and how they are drilled or mined.

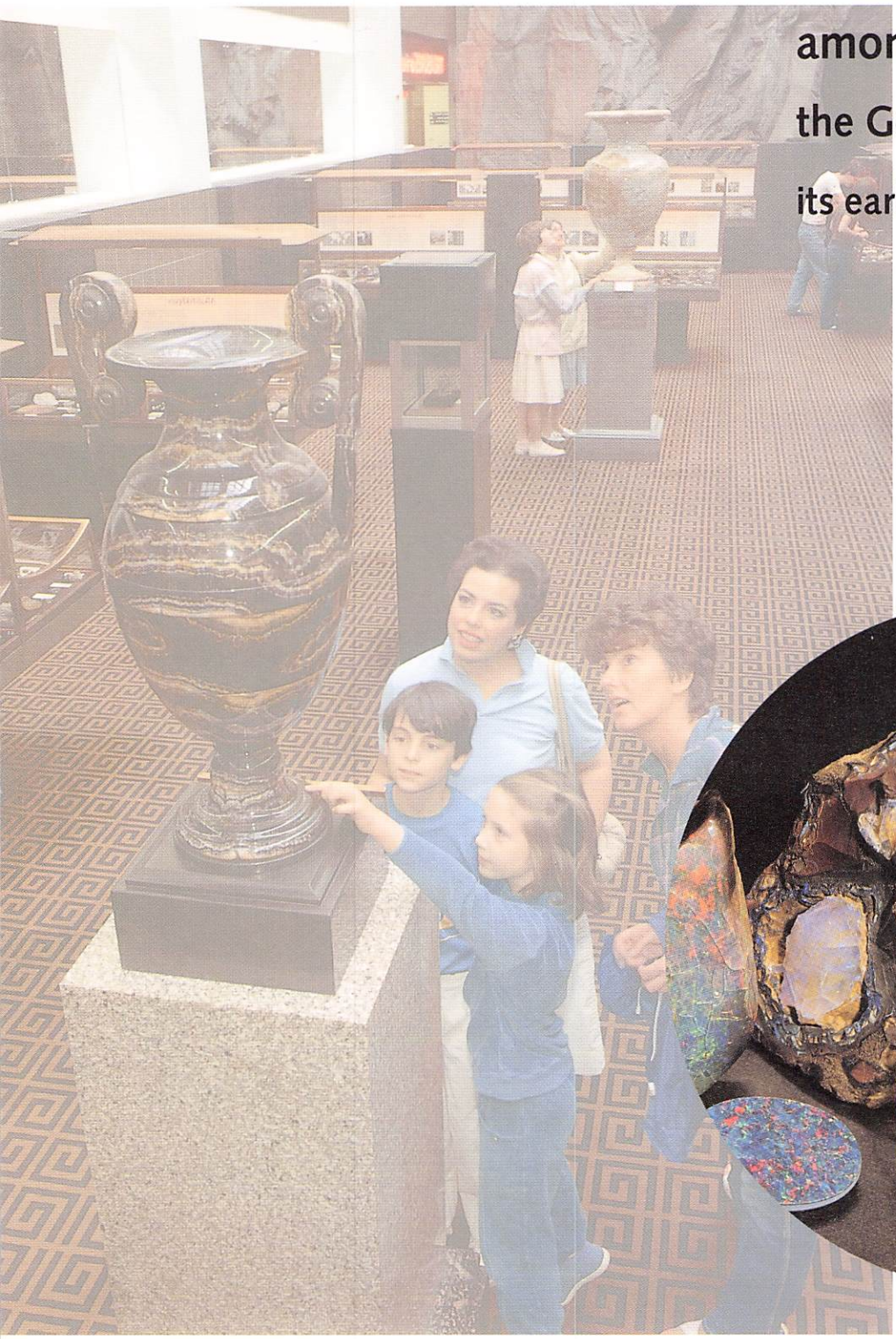
Finally, you can consider another of the Earth's treasures, one which we tend to take for granted - water. Water is present in vast underground reservoirs and is used and recycled in many different ways, not only by people but also by nature itself.

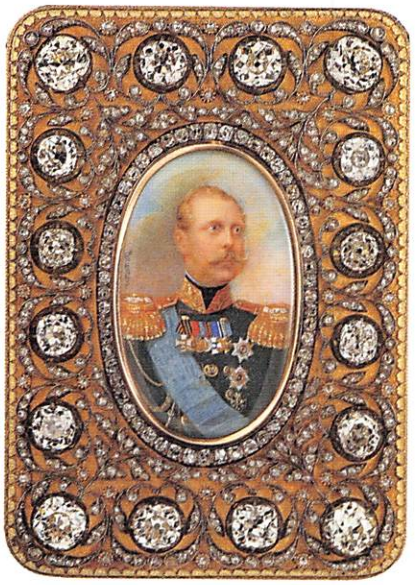
GEMSTONES

Below: A large vase, made in 1868 from a form of fluorite called Blue John
Circle: The word 'opal' probably derives from the Sanskrit for 'precious stone'

Gemstones have been on display among the minerals at the Geological Museum since its earliest days.

When the new Geological Museum was laid out in 1935 the gems and decorative stones were taken out of the main mineral display and given pride of place in the centre of the ground floor where they can still be found today.





A gemstone is a mineral that has been cut or shaped for decoration. It will be beautiful, either by virtue of its colour, as in ruby, emerald or sapphire, or its sparkle, as in diamond. Although most gemstones are transparent, some have a silky sheen, such as moonstone, or a play of colours, such as opal. In many cultures gemstones are worn not only as objects of beauty, but as symbols of status and power. To serve this purpose they must be of the 'best' colour, flawless, large and rare.

Other decorative materials featured in the displays include carvings made from agate, jadeite and turquoise; rocks, such as serpentinite and lapis lazuli; and substances, such as amber, pearl, jet, ivory and coral, which were once a part of living creatures.

The gemstone display in the Museum aims to show the large number of minerals that can be used as gems. Here you can see the remarkable stones that can be cut from such little known minerals as kunzite, zoisite, andalusite and scapolite.

In every case cut and carved gemstones are displayed alongside natural crystals and, where appropriate, synthetic stones are displayed for comparison.

A new gemstones and minerals exhibition will be opening on the first floor of the Earth Galleries in 1990.

Above left and right: The Murchison Snuff Box, in daylight and ultraviolet light

Top left: A cut gemstone perched on a large spodumene crystal
Centre: Frog carved in bloodstone
Bottom: Mask of an Aztec god

Agates by H McPherson

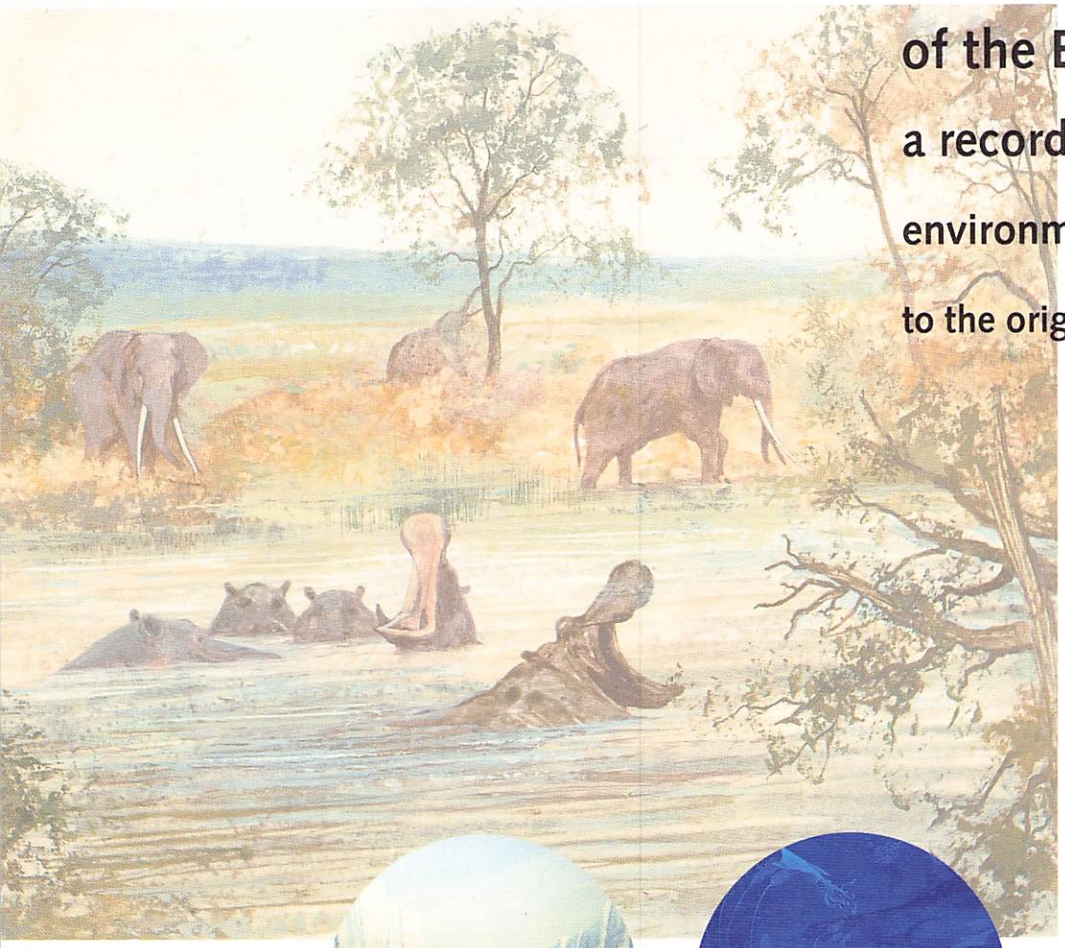
Gemstones by C M Woodward & R R Harding

Crystals by I F Mercer

BRITAIN BEFORE MAN

The continents act as the history books of the Earth - they carry a record of events and environments that stretches back to the origin of the Earth itself.

Below: Trafalgar Square, London, 100 000 years ago



Britain before Man **investigates the record preserved in one small patch of the Earth's crust, the north-western edge of the Eurasian continental mass.**

The exhibition shows the history of Britain long before the appearance of its people or the coastline that we know today.

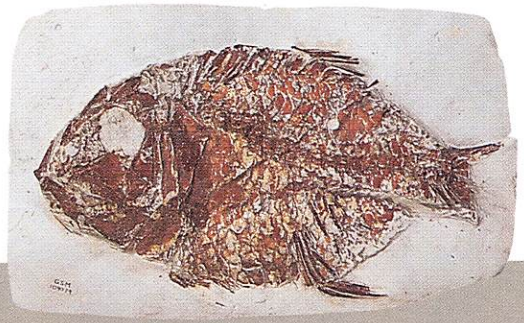
The story that emerges is one of four long, relatively tranquil geological eras when layers of rock were laid down under the sea or on land to produce four 'structural storeys' in Britain. Separating these times were shorter, more turbulent episodes during which the layers were bent and broken, volcanoes were active and mountains were formed.

In the exhibition, Britain's story is told with a series of dioramas, paintings and models that reconstruct the ancient land and its animals and plants. You will also find many specimens of the rocks that have shaped the British Isles, as well as photographs of present-day landscapes.

Right: Around 670 million years ago a great ice sheet moved over an area that is now Scotland
Far right: Life on the floor of the chalk sea

Left: Rapid evolution of these fossil ammonites has provided geologists with a valuable time key

BRITISH FOSSILS



Left: Bony fish from Rochester, Kent

The remains or traces of long dead animals and plants preserved in rocks are known as fossils.

Above: View of the gallery showing the 'fossil wall'

In Britain, fossils can be found in the rocks of all the main geological periods.

They can be used to trace ancient environments in the study of evolution, or as evidence to date rocks.
The exhibition of *British fossils* attempts to answer the following questions: where are fossils found? how do we give them names? what exactly are they? Large models show some well-known fossil animals, such as trilobites and ammonites, and the fossil trees that formed our coal.
Fossils can be collected by anyone who knows where to look for them. A video programme will give you hints on how to start up as a fossil collector.
A large part of the exhibition is devoted to a collection of British fossils that you can use for reference. They are displayed in a series of cases according to their geological age - all the fossils from any one rock formation are arranged together. Each section gives information about the geography and climate of the time periods and the localities in which particular rock formations can be seen.

A fossil's fate

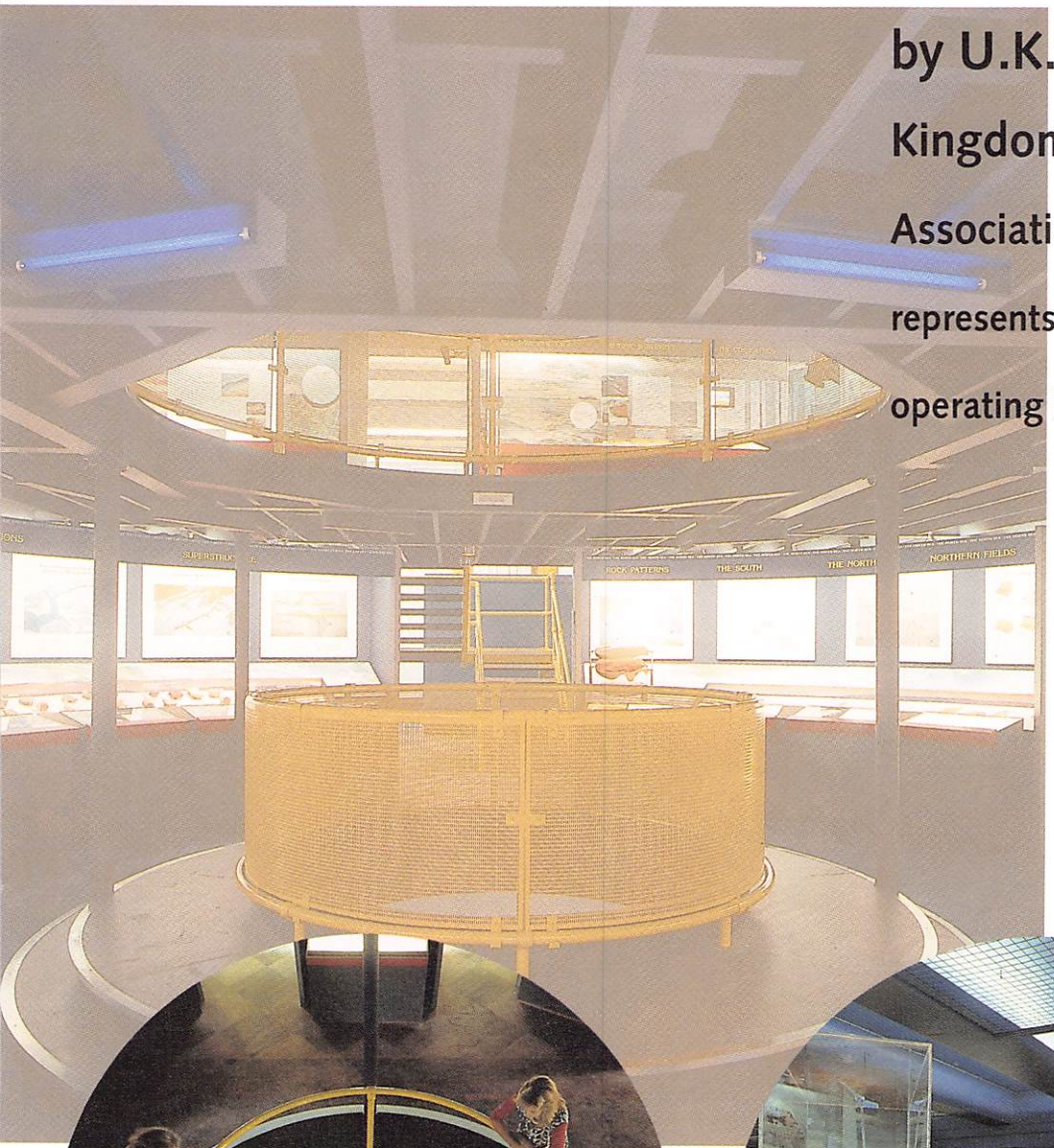
Fossils arrive at the Museum from three sources - the Museum's staff, amateur collectors and professional fossil hunters. In the palaeontology laboratories, fossils are extracted from the surrounding rock and cleaned to allow identification. Some fossil types can be recognized immediately, but if the fossil is from a poorly known locality or of an entirely unknown species, identification can be very complicated.
Once identified, the fossil can be used to investigate how the ancient creature lived. Such research may help to elucidate the reasons why some species have survived over millions of years, while others have become extinct.

Top left: Ammonite marble from Marston Magna, Somerset
Bottom: Bed of crinoids from Lyme Regis, Dorest

British Fossils Identification (3 book set)
British Fossils by J C Thackray

BRITAIN'S OFFSHORE

Below: Both decks are crammed with exhibits
Left circle: Advanced video techniques bring the North Sea to life
Right circle: Production platform models, accurate to the last detail

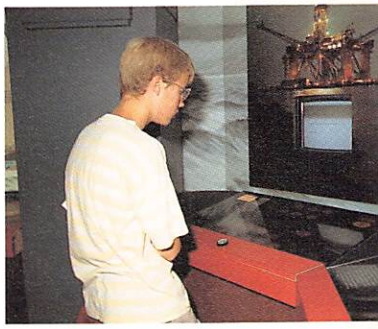


This modern exhibition is sponsored by U.K.O.O.A. (United Kingdom Offshore Operators Association), an organization that represents the oil and gas companies operating in British waters.

In keeping with its subject matter, the exhibition is designed in the form of an oil platform with two decks.

The lower deck features the geology of the Earth's crust under the sea around Britain. Here you can discover how the forces caused by gradual movements of continents have formed and shaped oil-bearing rocks, and how the lush, swampy rain forest that covered these areas 300 million years ago now provides Britain's oil and gas reserves.

OIL & GAS



Top: Hunting for North Sea treasure with a seismic map
Bottom: Make your own 'decision to drill'

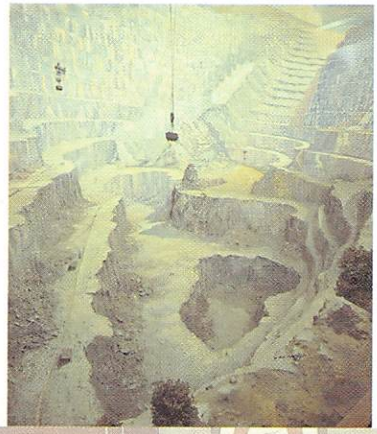
Left: Climb on board the production platform

The formation of these reserves is, to a large extent, a matter of chance, requiring not only the correct combination of rock type and structure, but also a specific sequence of environmental changes.
Exhibits on the upper deck explain the sophisticated exploration technology used to locate oil and gas. A promising result from a preliminary seismic survey leads to test drillings, rock sampling and computer modelling of the land beneath the sea. All of these are needed in order to assess whether or not the vast costs of constructing a production platform can be justified.

The size and type of oil platform which is built to extract oil and gas depends on many factors including the depth of the sea and the distance of the 'find' from land. Large-scale models of several different oil platforms show how oil and gas are obtained and transferred to land for our use.
A separate section of the exhibition outlines the history of the exploration of our offshore waters from the first discovery of gas in 1965 and of oil in 1970. It explains the many issues, such as international boundaries, licensing and safety factors that have been considered over the years.

There are three video films in the exhibition: 'Liquid assets', at the centre of the exhibits, tells the story of the formation, discovery and development of offshore oil; a 50-minute programme in the video theatre shows the construction and operation of an oil platform; and in addition there is an instructive cartoon for younger visitors.

MINERAL



Left: Slate from Welsh quarries, such as the Penrhyn Quarry, is used for roofing all over Britain

The second floor of the Museum's Earth Galleries was laid out in 1935 as a showcase of rocks and minerals of economic importance.

Since then the maps and diagrams have been updated, but on the whole the gallery retains its pre-war appearance.

One side of the floor is taken up by metals such as iron, lead, zinc and copper. The other has displays of the precious metals, gold and silver, together with the non-metallic materials such as sulphur, graphite, phosphates and abrasives.

Overall, the gallery shows the geology of the minerals and rocks that were most important in 1935. Many features, such as the copper mines of Cornwall and silver mines of Freiberg, are now of special historic interest.

The many rock specimens on display help build up a picture of the typical geology of each ore. For example, platinum is exhibited with the dark igneous rock in which it is found. Many other cases contain beautiful examples of the ore minerals and the minerals which are found with them, known as the 'gangue'. The lead-zinc exhibit, for instance, contains many lovely specimens of galena, sphalerite, calcite, fluorite and dolomite.

The displays are full of amusing and interesting curiosities. Look out for the delicate graphite carvings and the case of rock salt which includes a necklace that you would be ill-advised to wear out of doors in Britain!

Above: Early Victorian panel made entirely of British stone
Left: Baryte from Cumbria

DEPOSITS OF THE WORLD

Minerals from the collection of Henry Ludlam, a Piccadilly hosier, who bequeathed 18 000 minerals to the Museum in 1880
Top: Torbernite from Cornwall
Middle: Pyromorphite from Cornwall
Above: Calcite from Cumbria

This diorama of a Northampton ironstone quarry in 1935 is of historic interest because ironstone is no longer mined in Britain

Cornish gold

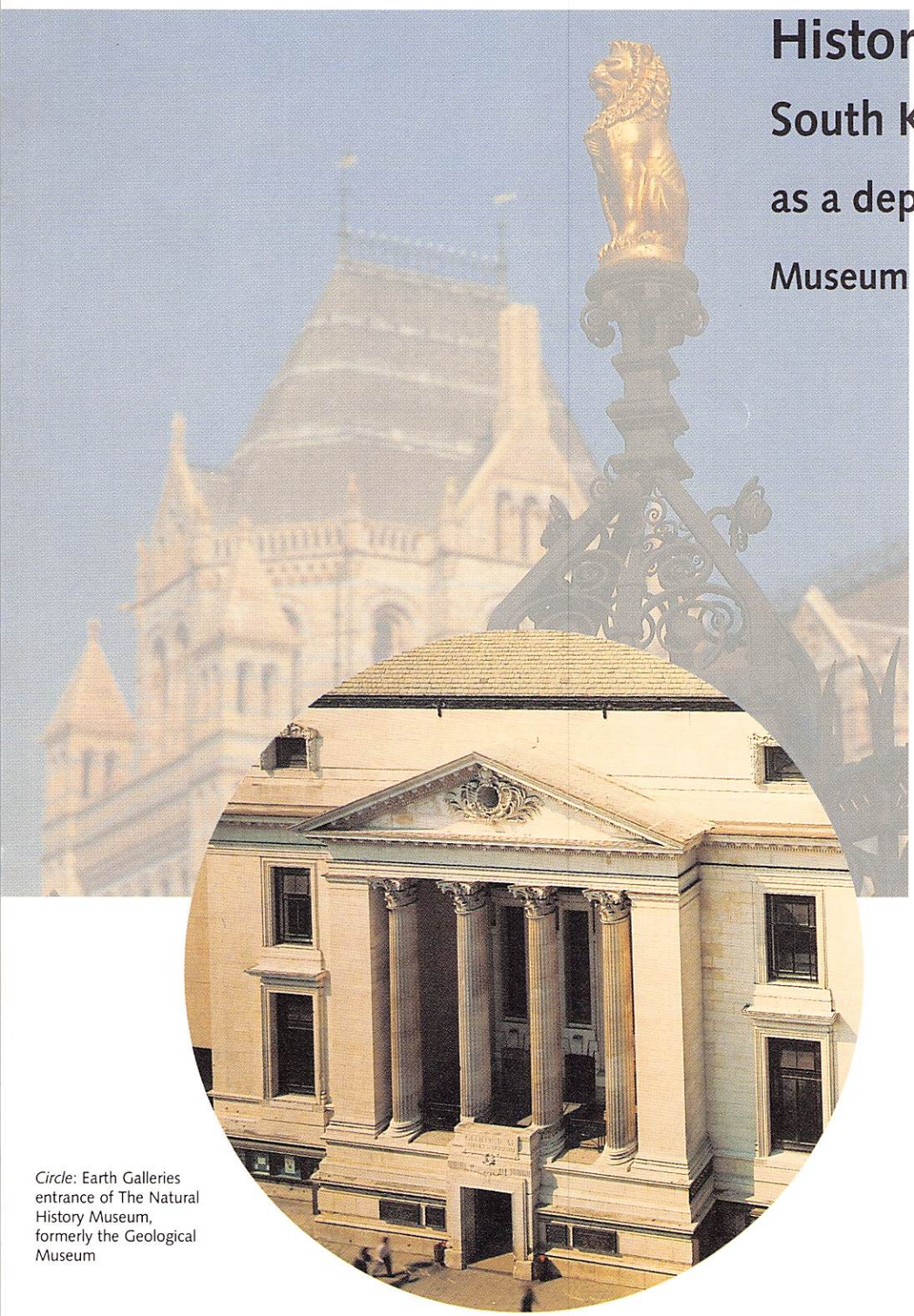
Records of gold in Cornwall date from the sixteenth century. In river valleys and streams, gold is often associated with resistant minerals such as cassiterite, and usually occurs as plates or small nuggets. The largest nugget, weighing nearly 60 grams, was found in 1808 in the Carnon Stream Tin Works, near Truro.
Although there is little recoverable gold in the tin, copper, lead and zinc deposits of the area, gold has been found in some of the antimony mines of north Cornwall. By studying the minerals associated with the gold, Museum scientists are trying to discover its origin. They may also be able to predict other likely sources of this most precious of metals.

Minerals of Cornwall and Devon
by P G Embrey & R F Symes

Minerals of the English Lake District: Caldbeck Fells
by M P Cooper & C Stanley

ORIGINS OF THE

The Natural History Museum in South Kensington began as a department of the British Museum in Bloomsbury.



Circle: Earth Galleries entrance of The Natural History Museum, formerly the Geological Museum

The immense private collection of Sir Hans Sloane, a wealthy physician, formed the basis of the British Museum.

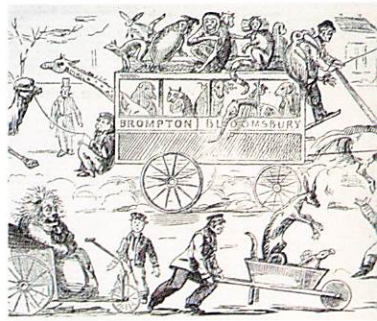
On his death, in 1753, he bequeathed his collection to the nation, in return for a payment of £20 000 to his heirs. The money was raised by private lottery and the British Museum was founded the same year.

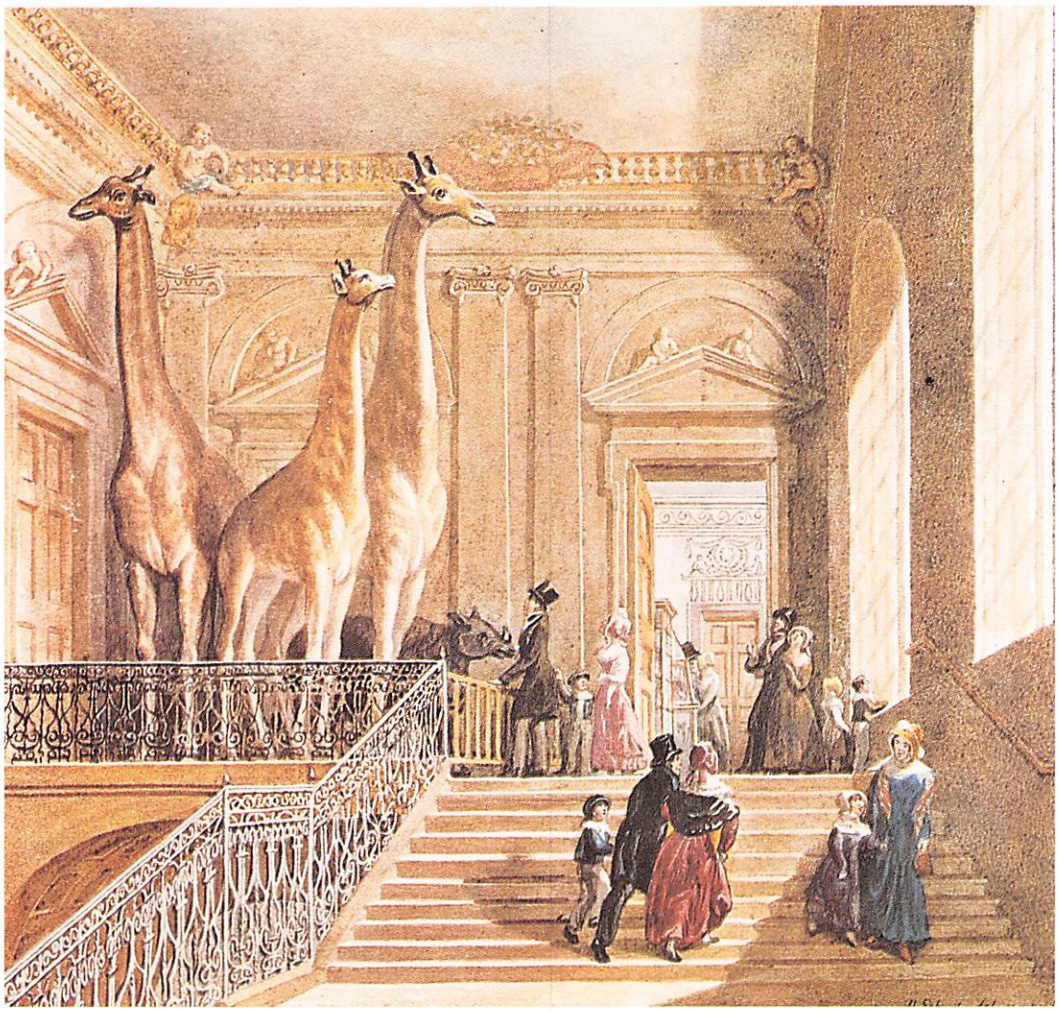
At first his countless animal, plant and mineral specimens, coins, manuscripts and other treasures were kept together in Bloomsbury. But, over the years, as new objects poured in, shortage of space became a major problem. In 1860, a momentous decision was taken to move the natural history collection from Bloomsbury to a new location. Part of the site of the 1862 International Exhibition in South Kensington was acquired for the new museum, and the architect Alfred Waterhouse was commissioned to design a suitable building. He was to follow guidelines set out by Dr Richard Owen, a distinguished anatomist, who was Superintendent of the Natural History Departments at the British Museum.

In 1881, after seven years of construction beset with difficulties, the Museum first opened its doors to an enthusiastic public.

The Natural History Museum remained, administratively, a part of the British Museum until 1963 when it became an independent institution.

MUSEUM





Top: Montagu House in Bloomsbury - the first home of the British Museum
Bottom: Cartoon from Comic News in 1863, showing the removal of animal specimens from Bloomsbury to South Kensington

Left: Staircase near the entrance of the old British Museum, Montagu House, in 1845

Since then there has been another great change. In 1985, The Natural History Museum took over the care of its neighbour, the Geological Museum, from the British Geological Survey. Founded in 1835, the Geological Museum was an offshoot of the Geological Survey. Henry De la Beche, founder of the Survey, was employed by the Government to investigate the geology of Devon. In 1835 he pointed out to the Chancellor of the Exchequer that, as he would inevitably amass rocks, minerals and fossils during his work, it would be both useful and inexpensive for the Government to set up a museum. Rooms were provided in Craig's Court, off Whitehall, and the Museum came into being.

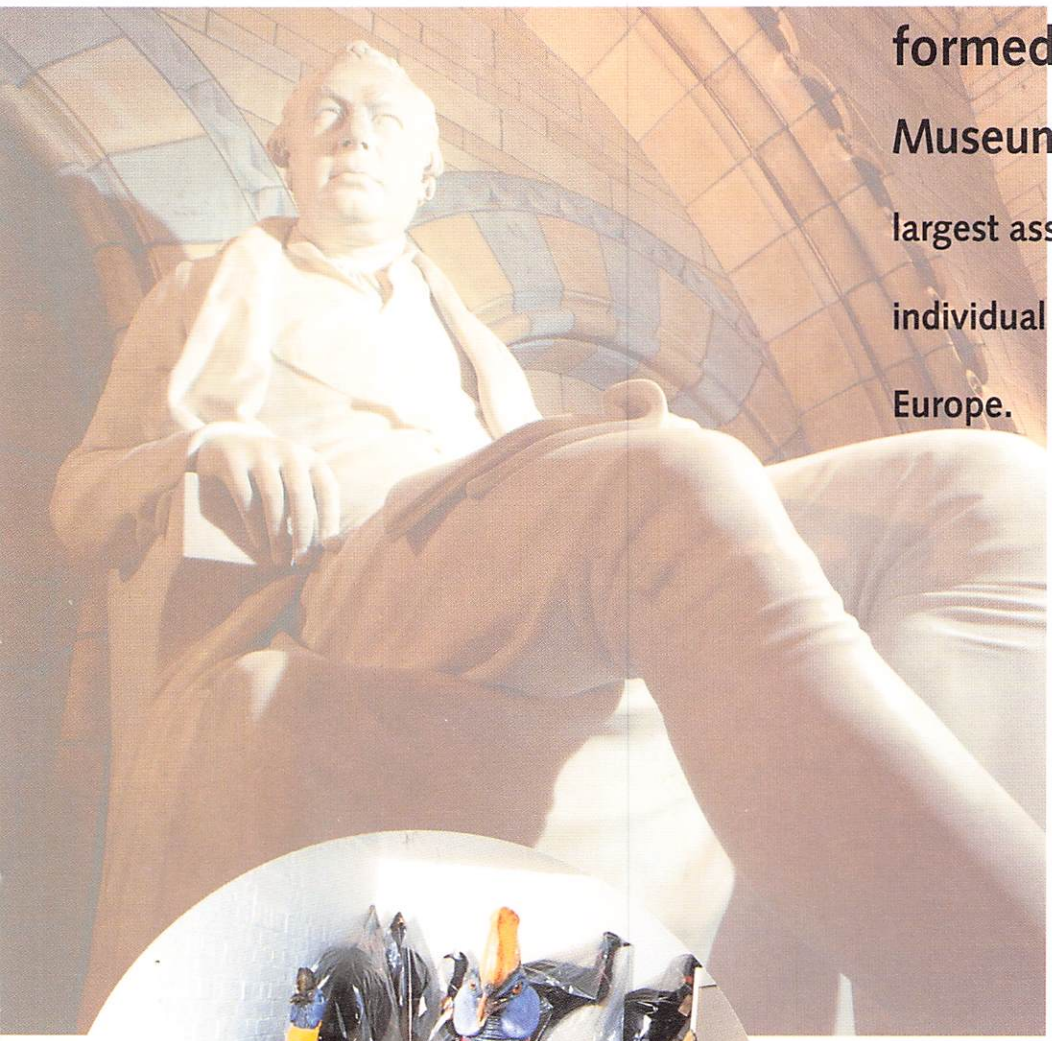
The tiny galleries were soon full and so, in 1851, the collections were moved to a new building, near Piccadilly, opened as The Museum of Practical Geology. But by the 1920s this building had to be condemned and the rebirth of the Museum came in 1935 at a new site in South Kensington.

To consolidate the recent merger of The Natural History and Geological Museums, *Lasting Impressions*, a spacious, modern gallery connecting the two buildings, was opened in 1988. The expanded Natural History Museum now offers visitors the opportunity to explore the Earth and its life, both past and present, under one roof.

Right: Sir Hans Sloane, the founder of the British Museum. Sloane Square and Hans Crescent were named in his honour
Centre: Henry De la Beche (1796-1855), the founder of the Geological Museum
Far right: Richard Owen, a skilled anatomist, was the first person to coin the word 'dinosaur' (Greek for 'terrible lizard')

GROWTH OF THE

Sir Hans Sloane's collection, which formed the basis of the Museum, was probably the largest assembled by any private individual in eighteenth-century Europe.



Above: Sir Joseph Banks (1743 - 1820). This statue used to stand in Montagu House, the first home of the British Museum; it can now be found on the second floor
Circle: Part of a unique collection of 65 mounted cassowaries, bequeathed to the Museum by Lord Rothschild on his death in1937

Apart from some 50 000 books there were over 10 000 animal specimens, 334 volumes of pressed plants and a large number of minerals, rocks and fossils.

Although most of the animal specimens have perished, all 334 volumes of his herbarium have survived and even today are an important source of biological information.
During the first 40 years of the British Museum's existence the collections grew mainly as a result of British interest overseas. The most notable voyages of discovery were probably those of Captain Cook. In 1768, on his first voyage around the world, he was accompanied by a wealthy naturalist called Joseph Banks, who donated a considerable amount of material to the Museum.
Banks selected skilled natural history illustrators and artists to accompany him on this voyage. One of them, Sydney Parkinson, completed three volumes of animal drawings and eighteen of beautifully depicted plants, which remain part of the Museum's extensive collection of original drawings. (Today, The Natural History Museum holds the third largest collection of watercolour drawings, after the British Museum and the Victoria and Albert Museum).

COLLECTION

Top: Coral specimens collected during the *Beagle* voyage with Darwin's original label
Above: Weedy sea dragons drawn by Ferdinand Bauer on Matthew Flinders' circumnavigation of Australia in HMS *Investigator* between 1802 and 1803

In the ninteenth century the number of specimens in the collections increased prodigiously through expeditions made specifically for scientific reasons. Among the early acquisitions were specimens from Darwin's voyage on HMS *Beagle*, the entire museum of the Zoological Society of London and of the East India Company.
The growth of the collections now amounts to around half a million additions each year. Increasingly, collecting is more specific and is carried out by Museum scientists who tend to concentrate not only on gathering species, but also on observing them in their natural habitats.

Above: A specimen of *Banksia* collected on Cook's first voyage and named in honour of Joseph Banks

Right: Platypus by Ferdinand Bauer

Sir Joseph Banks by H B Carter

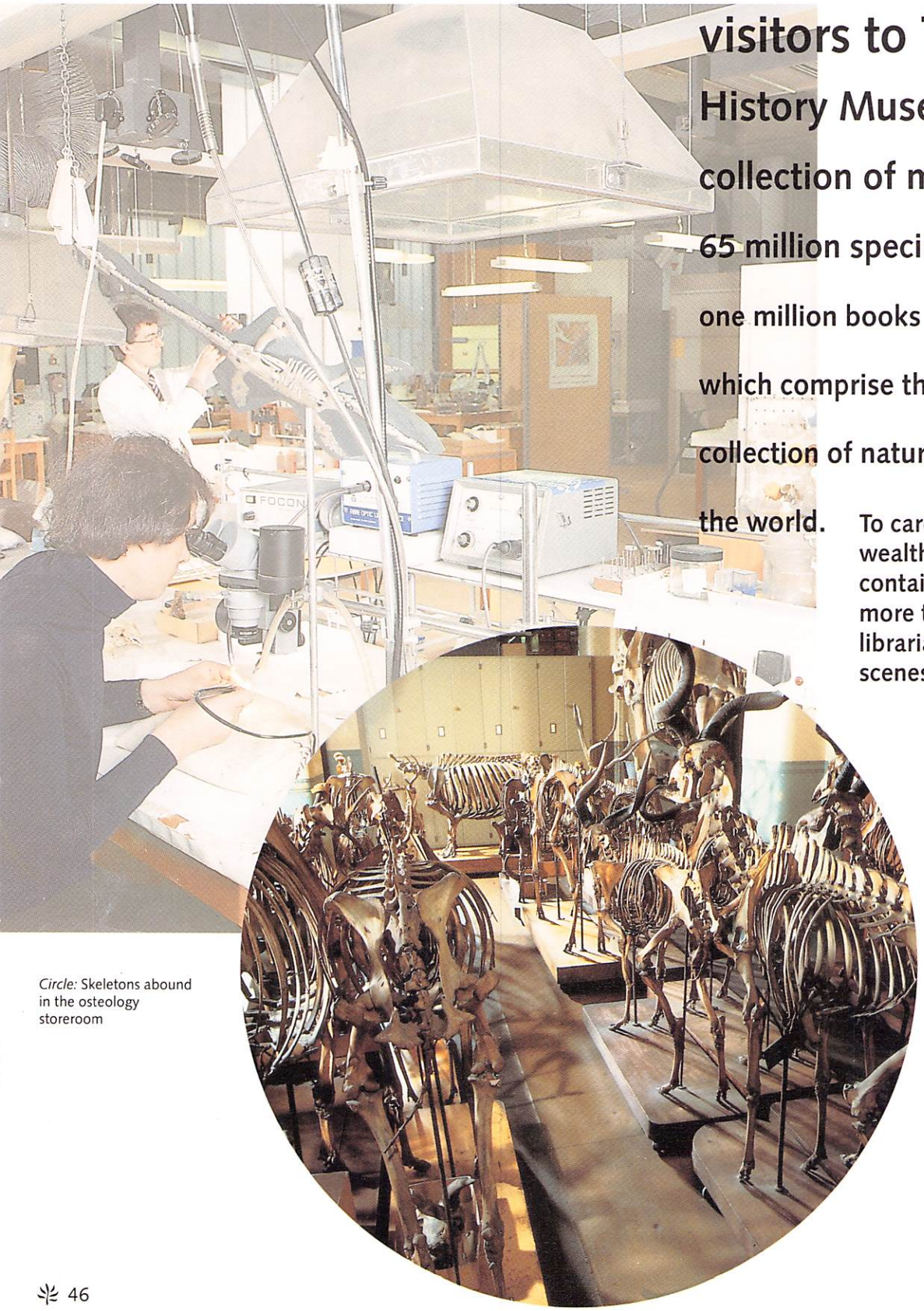
The Chelsea Gardener: Philip Miller 1691 - 1771 by H Le Rougetel

BEHIND THE

Below: Removing the surrounding stone from a fossil using dental drills

Unseen by most visitors to The Natural History Museum is the vast collection of more than 65 million specimens and one million books and manuscripts, which comprise the most complete collection of natural history material in the world.

To care for and organize the wealth of information contained within it, there are more than 350 scientists and librarians working behind the scenes.



Circle: Skeletons abound in the osteology storeroom

SCENES

Above: Behind the Museum's facade a jumble of rooftops conceals its treasures
Far left: Modern electron microscopes can magnify objects as much as a million times
Centre: The General Herbarium contains nearly two million specimens of flowering plants and conifers
Left: In the Spirit Building there are 4.5 kilometres of shelves devoted to fishes alone

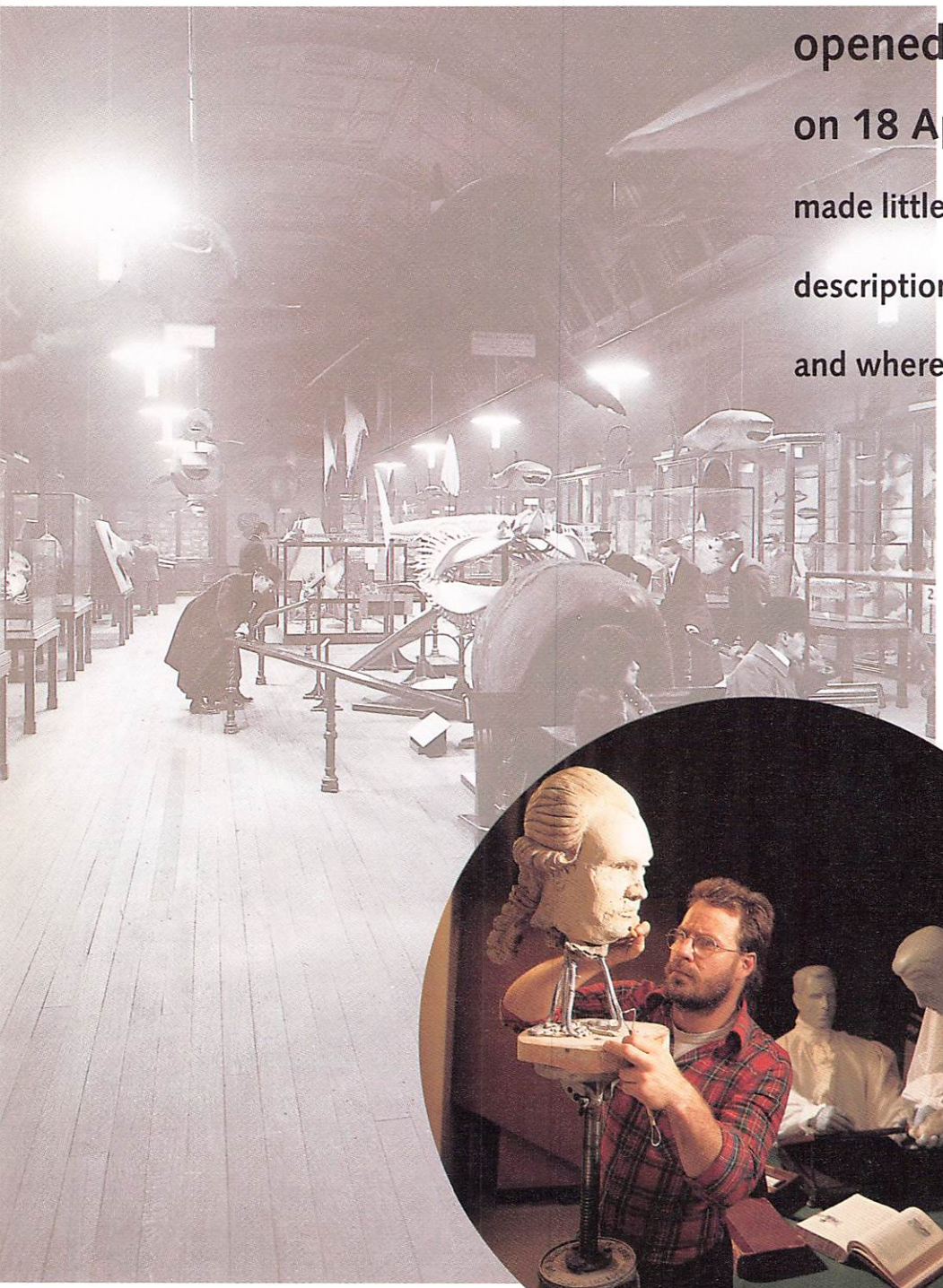
The research conducted by Museum staff on particular groups of animals, plants, minerals or fossils is internationally renowned. It is used to resolve a diverse range of problems worldwide, often involving doctors, farmers, conservationists, and specialists in the fishing and oil industries. Some of these applied research projects are mentioned in the exhibition sections of this guide.

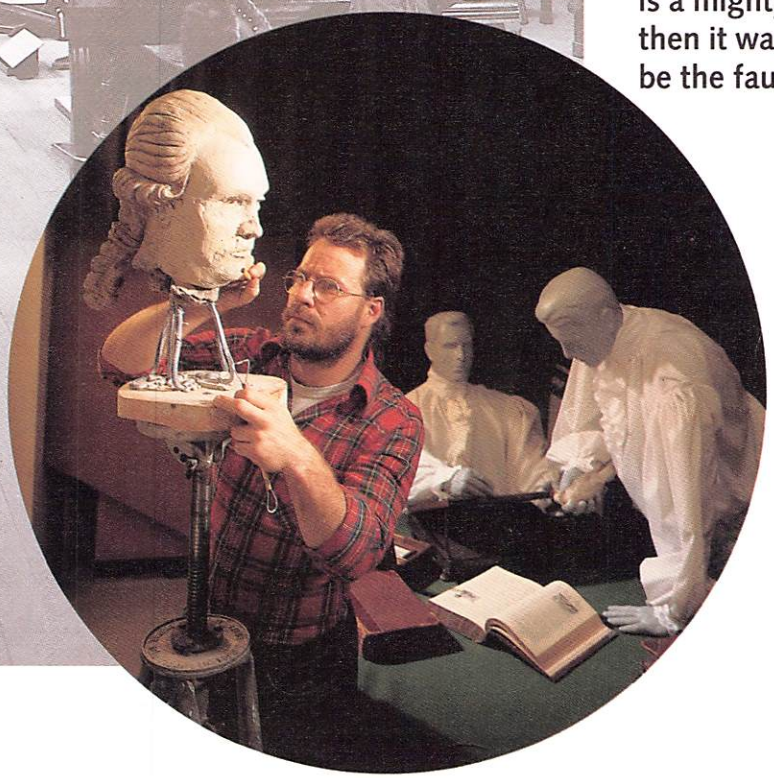
EXHIBITIONS

When the Natural History Museum first opened at South Kensington on 18 April 1881, the displays made little attempt to go beyond a brief description of what the specimens were and where they came from.

Visitors were expected to educate themselves and, as one scientist wrote at the time, if they left with, '... nothing but sore feet, a bad headache and a general idea that the animal kingdom is a mighty maze,...' then it was not considered to be the fault of the displays.

Below: The fishes gallery in 1911 (just after installation of the first electric lights).

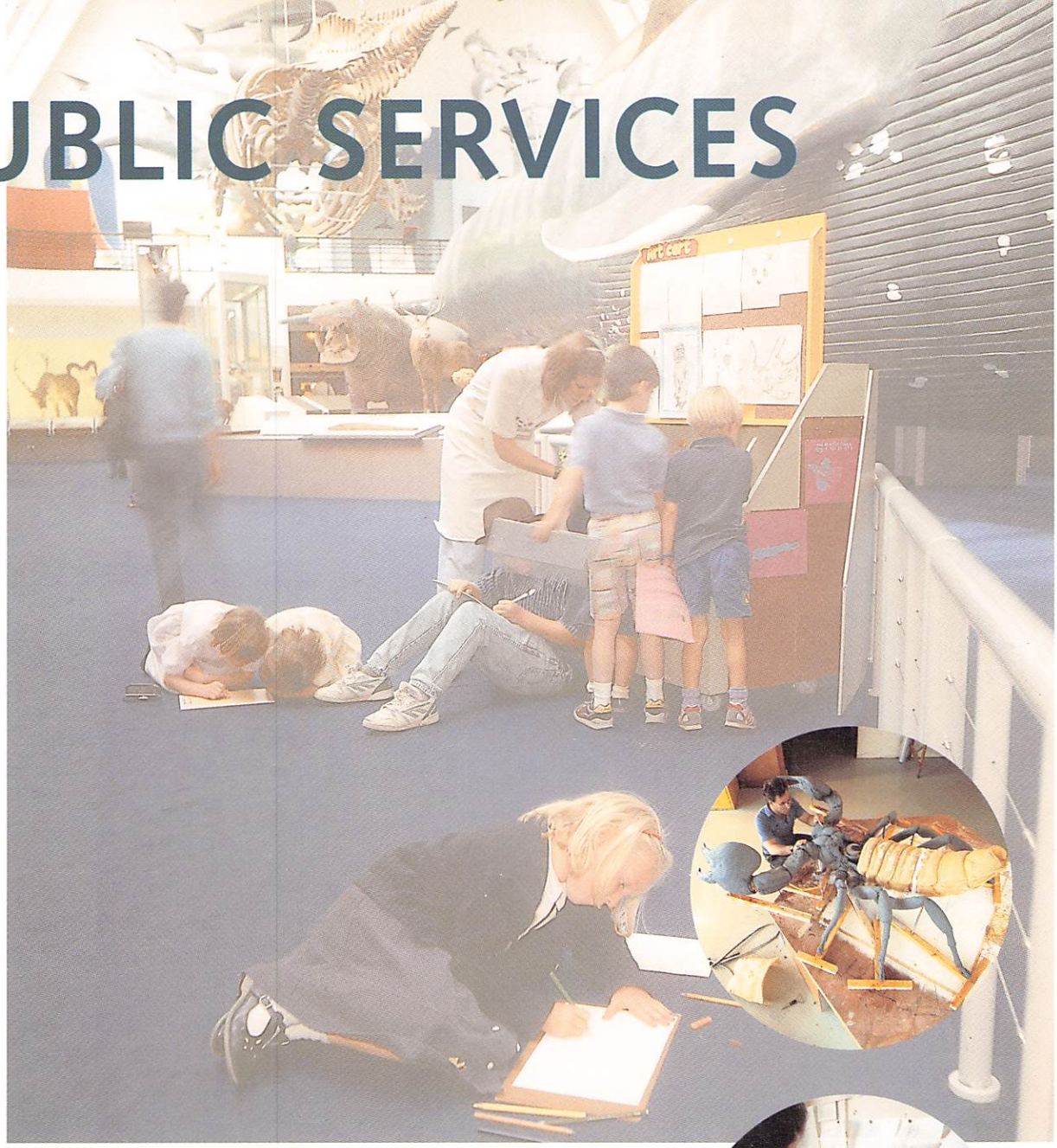




Circle: A Museum modelmaker sculpting the head of Daniel Solander, a Swedish botanist, for a travelling exhibition

& PUBLIC SERVICES

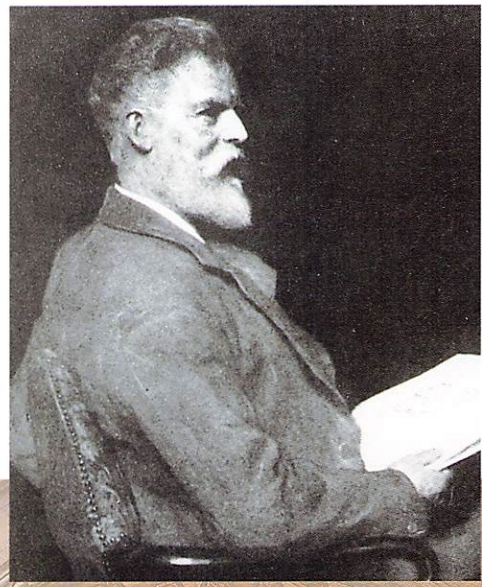
Right: Young artists at work
Top circle: Making a giant scorpion for the *'Creepy-Crawlies'* exhibition
Centre: Preliminary sketches are always made before a model is constructed
Bottom: A model of a neandertal woman begins to take shape



The first galleries echoed the Victorians' tastes and ideas, and were limited by the display techniques that were available. However, over the last hundred years, the public galleries have changed dramatically.
In 1972, a programme of exhibition renewal was begun that is still underway. Using advanced and innovative methods of display to interest and entertain visitors of all ages, new-style exhibitions put natural history in context. They aim to show not only the diversity of the natural world, but also some of the underlying principles of science - such as how natural forms have evolved and how living things interact with each other and with their non-living surroundings.

The first of these exhibitions, Human biology, was completed in 1977 and in 1980, largely as a result, the Museum was awarded the coveted title of 'Museum of the Year'. Since then many other permanent exhibitions have been developed.
The Museum's visitors vary tremendously in age, interest and in the time they have available to spend in the galleries. For enhancing or interpreting exhibitions there are books and leaflets and special public events. For more information about Museum services for adults and children, please refer to pages 54 and 55.

DESIGN



Right: Alfred Waterhouse, the Museum's architect, was born in Liverpool in 1830

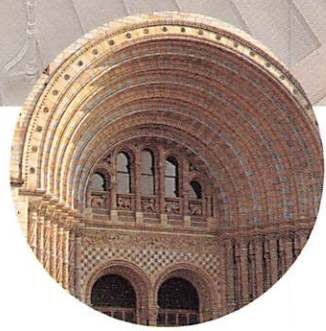
Construction of the Natural History Museum began in 1873.

It was first opened to an enthusiastic public in 1881 and its unusual style was as much admired then as it is now.

In Victorian times museums were expected to look important, and the Natural History Museum had to be suitably designed 'for housing the works of the Creator'.

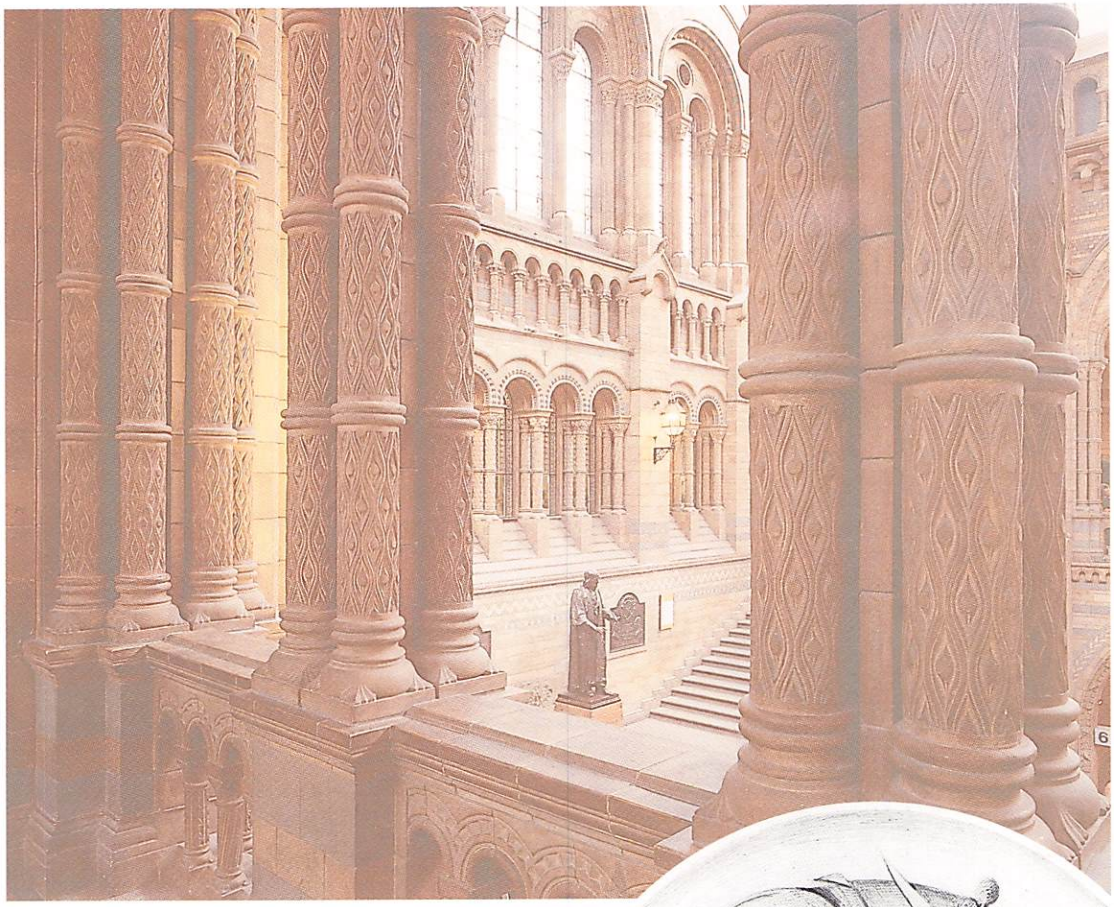
The result was this cathedral-like building, with its huge façade, grand central entrance and high-spired towers. Alfred Waterhouse, the Museum's architect, successfully combined historical style and new technology. Everywhere there are round arches and columns typical of Romanesque styling but, unlike medieval Romanesque buildings, Waterhouse adopted the latest methods of construction using an iron and steel framework.
To decorate this framework, Waterhouse covered the building with buff and pale-blue terracotta and, sensitive to every detail, he ornamented the terracotta, both inside and outside, with sculptures of plants and animals. All those on the western wing of the building are of living forms, while those on the eastern side depict extinct forms.

Above: A view of the Central Hall from the second floor



Far left: The Museum's main entrance
Left: The high-spired towers

OF THE BUILDING



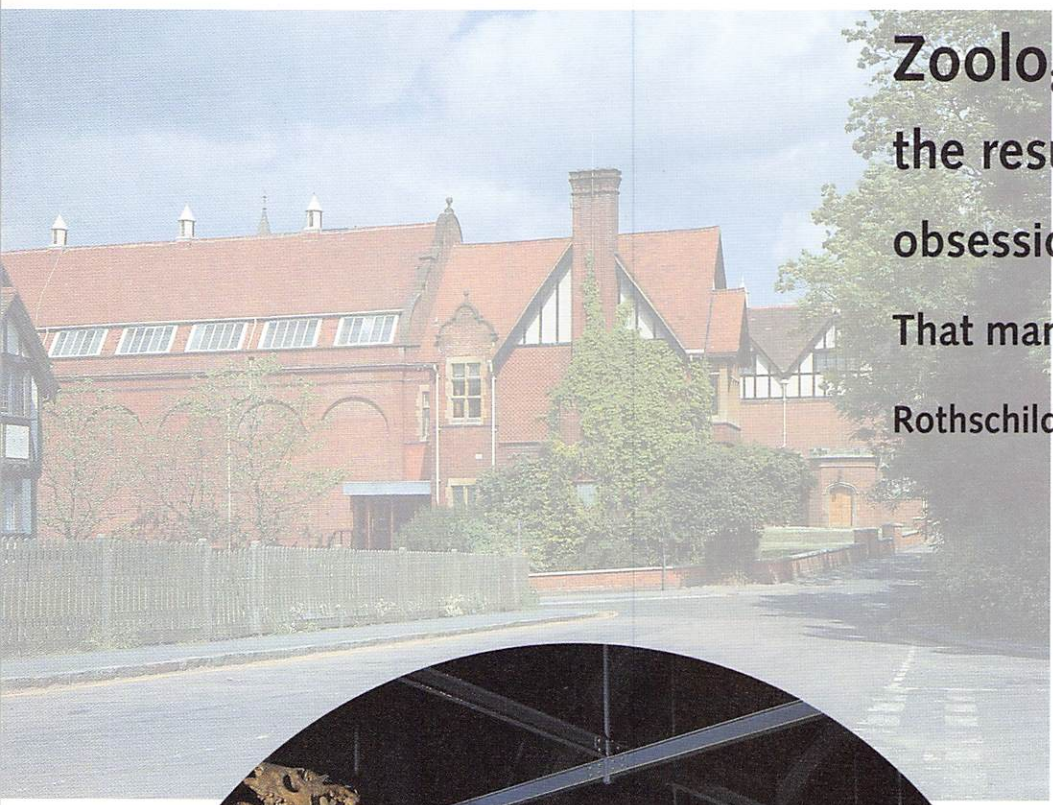
Above: Waterhouse's architecture deserves as much attention as the displays
Left: Waterhouse's pencil sketch of a grey heron for a terracotta pannel

Through the huge Cromwell Road entrance, visitors enter the great Central Hall, which is like the nave of a cathedral. At the end of the Hall a single grand staircase divides at a landing and climbs up to the first floor galleries. Facing back towards the entrance there is a fine view of the arched bridge staircase that leads to the second floor and from this bridge a bird's eye view down into the Central Hall.

Left: View of the Museum, about 10 years after it opened

THE ZOOLOGICAL

Below: The Museum as it looks today
Circle: The upper balcony



The origin of the Zoological Museum is the result of one man's obsession for collecting.

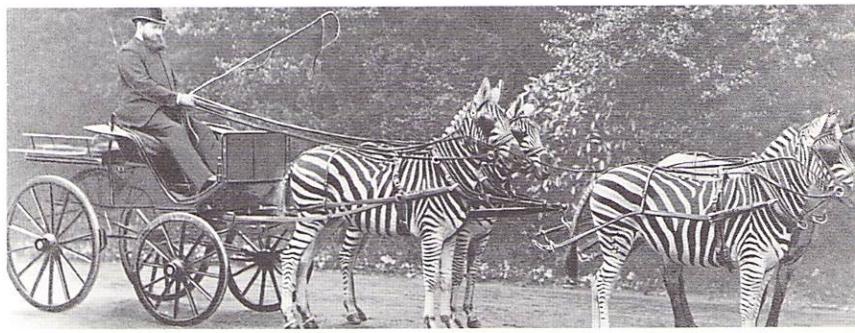
That man was Lionel Walter Rothschild.

At the age of 21 he was given a piece of land in Tring Park, Hertfordshire, by his father, the first Baron Rothschild and there he built two cottages - one to house his vast collection of insects and books and the other to house a caretaker.

A much larger building was also constructed to display Rothschild's mounted specimens. This was the beginning of the Zoological Museum. The Museum first opened to the public in August 1892 but by then Walter Rothschild had entered the family banking business so two professional curators were put in charge of the Museum. One of their first duties was to put the collections into order. Already there were over 4000 mammal and bird specimens on display while the study collections included more than 40 000 bird skins and over 500 000 insects. To cope with these vast numbers and provide more space for the library and public galleries, extensions to the Museum were constructed between 1908 and 1912.
Although under no obligation to display his collections, Rothschild was devoted to the public galleries.

MUSEUM, TRING

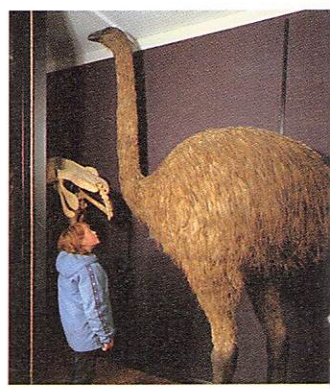
Circle: Lionel Walter, second Baron Rothschild - founder of the Zoological Museum, Tring
Right: Zebra power! Lord Rothschild and his carriage team



Above: Young visitors standing in awe of the mighty gorilla
Right: The giant moa illustrated in Rothschild's 1907 book *Extinct birds*

He would personally select the finest specimens and then invite the best taxidermists to prepare them. The resulting displays were, for their time, the finest to be seen anywhere.
Among the many unusual specimens currently on display are a collection of domestic dogs, an extremely rare specimen of the quagga (one of only 16 in the world) and the Museum's famous dressed fleas.
Walter Rothschild died in 1937, bequeathing his entire collections to the Trustees of the British Museum.

Below: A lifesize reconstruction of the extinct giant moa - the largest bird that ever lived



MUSEUM

Information Desk

Once inside the Museum be sure to visit the Information Desk, in front of the dinosaur Diplodocus. Staff here will be happy to inform you about the exhibitions and any special events occurring on that day. If you are bringing children, the Information Desk has a wide range of activity sheets for children of all ages to use in the galleries.

Public Events

The Museum organizes a diverse range of events for visitors of all ages. In the monthly events leaflet you will find news of theatrical events, films, children's workshops, lectures, competitions, guided tours and new exhibitions.
Admission to all events is free.

Museum Shops

The book and gift shops, situated near the main and side entrances of the Museum, offer a wide range of natural history and geology books, wall charts, maps, model dinosaurs, mineral specimens, sketch books, colouring books and many souvenir items, including jewellery and ceramics.

Refreshments

The Museum Restaurant offers a large range of hot and cold food, from home-made soup and salad platters to hot pies, baked potatoes and vegetables.
Under the Central Hall arches, the Juice Bar offers a range of refreshments including fresh coffee, Danish-style open sandwiches and delicious pastries. The Snack Bar situated in the Activity Centre area, offers such snacks as salad boxes, cookies, muffins and drinks.

Facilities for the Disabled

Wheelchairs are available at the main and side entrances of the Museum. For assistance please contact a warder.

Shopping by Post

Many Museum products and an unusual selection of toys and gifts may be ordered by post. Please write to our Mail Order Department for a free illustrated mail order catalogue.

Mailing List

If you would like to be added to our mailing list for details of forthcoming events and exhibitions, please send your name and address including postcode to Mailing List, Marketing Department.

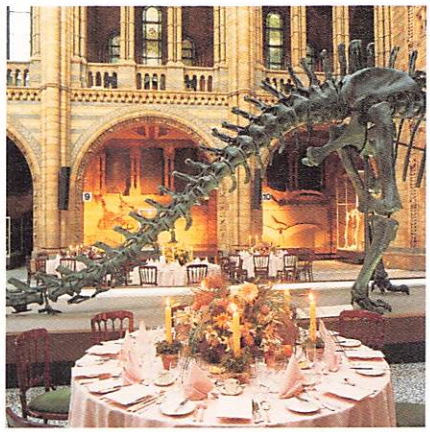
A wide range of products is featured in the mail order catalogue

Hire of the Museum

The Natural History Museum is a spectacular and prestigious venue for social and business entertaining of all kinds. For information about facilities and charges please contact the Functions Manager (tel 01-938 8934).

Visitor Resources

The Museum's exhibitions and building provide an excellent stimulus and educational resource for the study of the earth and life sciences. To meet the specialist needs of our visitors - both adults and children of all ages - the Museum offers wide-ranging services including tours for young children, activity sheets that interpret the exhibitions for children and young adults, and field trips.
For current details, visit the Information Desk in the Central Hall.



The Central Hall provides a memorable venue for parties

Discovery Centre

A new permanent Discovery Centre will open in 1990 in the Activity Centre. On a purpose-built site complete with courtyard, the Discovery Centre will feature both indoor and outdoor activities, as well as story-telling and scientists' talks.

Teachers' Centre

This reference centre offers teachers the opportunity to gather information and ideas for teaching natural history whether in the Museum, the classroom or outdoors. Here you can find out about the services that the Museum offers for schools, collect samples of activity sheets and browse through a collection of useful books, posters and visual aids.

Face-painting is just one of many public events

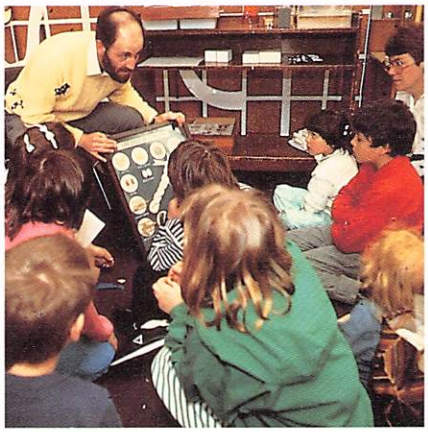
SERVICES

Teaching Courses

The Museum offers a variety of general and specific topic courses for teachers and student teachers. For details of the topics covered please write to Visitor Resources Section.

The Development Trust

The Development Trust has been set up to encourage individuals and companies to support specific projects within the Museum. Under the patronage of HRH The Princess of Wales, the Trust aims to raise sufficient funds to mount a stunning programme of permanent exhibitions over the next few years. The Museum looks forward to working with potential donors and sponsors. For more information, contact Mr AP Harvey, Secretary to the Development Trust, at the Museum (tel 01-938 8962/8786).



The Teachers' Centre provides information and advice on the teaching of natural history in the museum, in the field and the classroom

Natural History Museum Members' Club

If you would like to share in the wonders of the natural world and, at the same time, support the Museum's scientific, exhibition and educational programmes you can now become a member of the new Natural History Museum Members' Club. Apart from special events and exhibition previews, members also enjoy free admission to the Museum and discounts at the shops and restaurants. A members' magazine will keep you in touch.
For more details please write to: The Membership Office, Marketing Department.

The Rare Book Room, part of the General Library, houses many original natural history drawings and paintings as well as books and manuscripts

Recorded Information and General Enquiries

For 24-hour information on films, talks and exhibitions ring 01-725 7866. For other enquiries call 01-938 9123 during office hours.

Library Services

With more than 800 000 volumes and 20 000 periodical titles covering all aspects of natural history, the Museum is well-placed to serve the needs of the most demanding researchers. In most cases, readers' tickets can be issued on arrival.
Library services include an on-line information retrieval service, which allows researchers to scan and print abstracts from several major databases, and a specialist photo library. Charges for these facilities will be given on request.

THE NATURAL HISTORY MUSEUM

Cromwell Road
London SW7 5BD
Telephone: 01-938 9123

Opening times:
Monday to Saturday 10.00 - 18.00
Sunday 13.00 - 18.00

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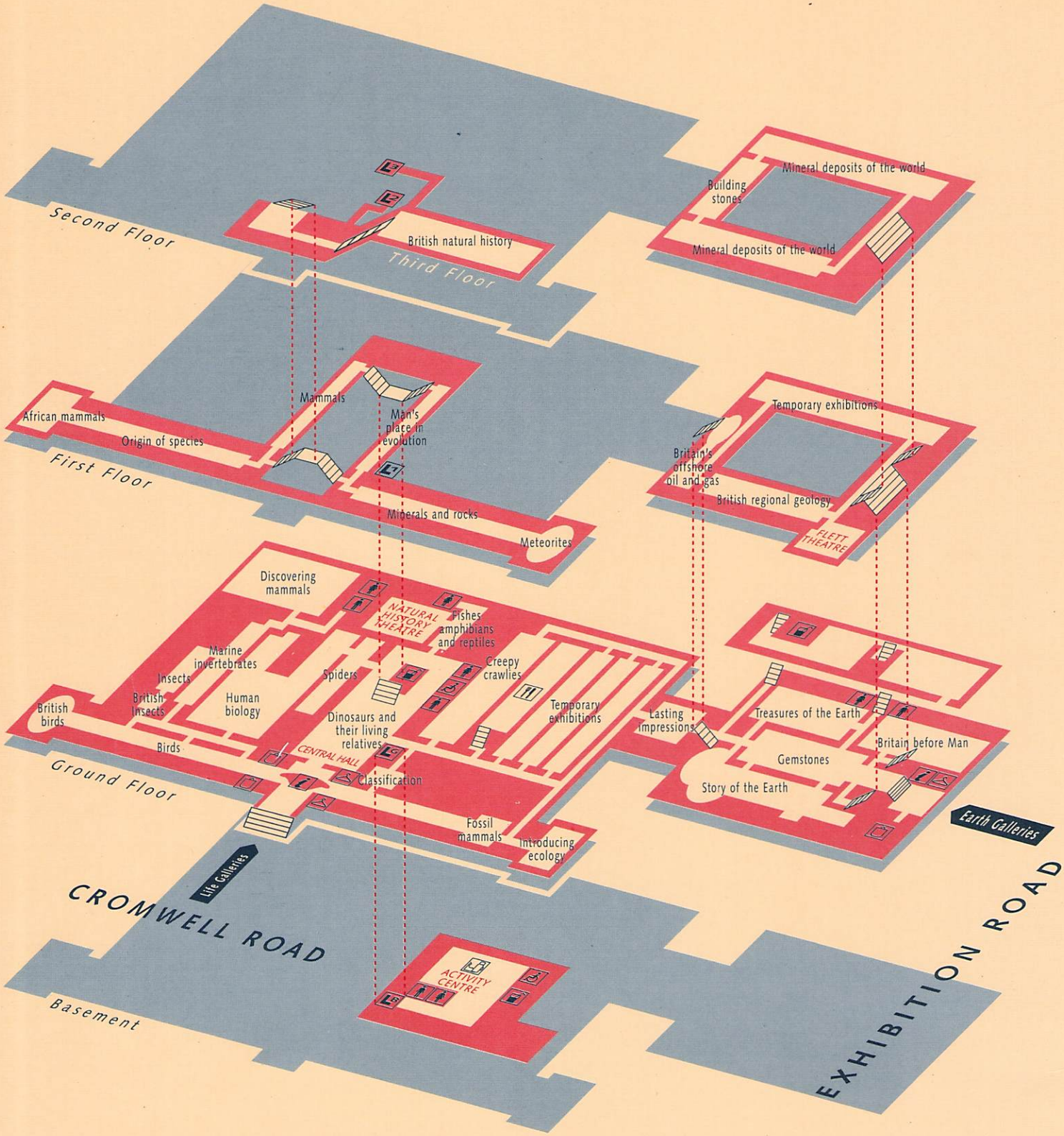


Information Centre

Lifts

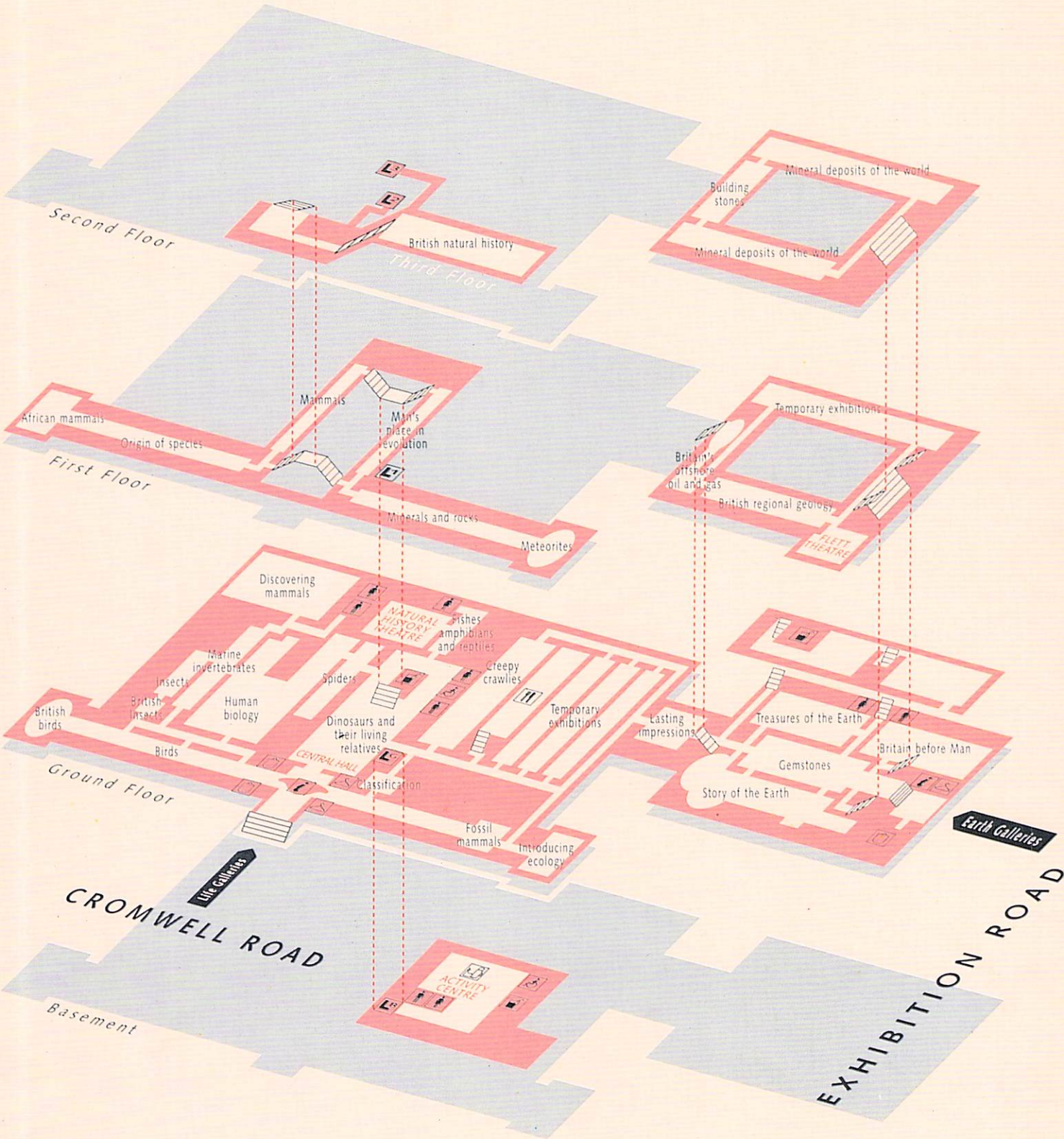
Shops: a fine selection of gifts, souvenirs, books, posters

The Museum Restaurant

Snacks

Picnic Area

Toilets



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